# COMPUTERWORLD

# Network Integration

*How rough is it?*

*An exclusive Computerworld survey and our quarterly Integration Strategies section explore the rugged terrain of multiprotocol networks*

- **Product incompatibility isn't your worst problem**
- **The great divide between network management wishes and realities**
- **The outsourcing option . . . where it's likely to be considered**
- **Plunging ahead with the tried and true**
- **Accounts from network integration adventurers**
- **Emerging support options**

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The Newspaper of Information Systems Management
February 1, 1993, Vol. 27, No. 5, 124 Pages, $2/Copy, $48/Year

# COMPUTERWORLD

*Mainframe futures*

## Users taking slow road to parallel processing

By Rosemary Cafasso and Johanna Ambrosio

The future of mainframe computing is here. But for many mainstream information systems shops, it could still take close to forever to get there.

Because of advancements in microprocessor technology and parallel processing techniques, lower cost multiprocessor systems and massively parallel machines are creeping into commercial IS.

IBM will unveil a reduced instruction set computing-based parallel processing machine this week and a System/390-based parallel processing data engine later this year. It could also outline its strategy for commercial parallel processing as soon as next month. The company, however, declined to comment.

Mainframes, *page 16*

# Microsoft woos IS

## Licensing plan offers steep discounts, more flexibility

By Christopher Lindquist
REDMOND, WASH

**In what it says is the first in a series of new programs aimed at strengthening ties with large customers, Microsoft Corp. last week unveiled a licensing program that gives volume buyers some breathing room in how they purchase software.**

While early adopters of the program have found it liberating, some potential customers remain skeptical about its value. The only serious concern to emerge from early reactions is a fear of being "locked in" to Microsoft products under the plan, which requires a certain degree of forecasting.

Under the Microsoft Select program, customers forecast how many units of a product or mix of products they expect to buy during a two-year period. That figure is used to determine pricing, which can be set per license or per machine. Customers then decide whether to use a license-based or enterprisewide tally, after which they can install the software as needed.

**Have it your way**

Microsoft Select consists of three individual programs:

**Microsoft Multiseat License Pak:** Up to 100 licenses for the same product at a 20% to 30% discount.

**Microsoft Variable License Pak:** By forecasting needs over two years, users can save 50% to 60%.

**Microsoft Enterprise License Pak:** By running Microsoft software on all their machines, users can earn discounts of 60% to 70%.

Customers must provide Microsoft with a quarterly report on the number of licenses installed or the number of hardware systems purchased and make quarterly payments to an approved "large account reseller" that is working with Microsoft. "LARs" are responsible for implementing the Select program with their customers.

The result, according to customers who have been beta testing the program, is an extremely flexible license that makes the job of tracking software — and staying legal — far easier.

Microsoft's previous licensing practices nearly cost it some sales

Microsoft, *page 20*

**Inside**

**Women in IS**
HOW ARE THEY DOING? A NEW *COMPUTERWORLD* SURVEY SHOWS THAT DESPITE LOWER PAY AND THE GLASS CEILING, ENTHUSIASM REMAINS HIGH. SEE PAGE 67.

BEGINNING THIS WEEK, *COMPUTERWORLD* IS AVAILABLE ON CD-ROM. EACH DISC INCLUDES THE COMPLETE TEXT OF THE PAST FOUR YEARS OF *COMPUTERWORLD*, THE PREMIER 100 AND COMPUTER CAREERS SUPPLEMENTS, AS WELL AS SELECTED GRAPHICS AND SURVEYS. SEE PAGE 84.

# IBM lowers Unix boom

By Maryfran Johnson
NEW YORK

IBM will present itself as a newly aggressive player in the fiercely contested low end of the workstation market tomorrow, when it breaks the $4,000 price barrier with a Unix-based color workstation.

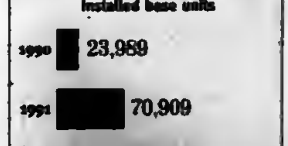
Sources close to the company said the bargain-basement RISC System/6000 — about one-third the cost of IBM's current low-end color model — is expected to be the star of a show featuring several new models of the RS/6000, better graphics plus a new data server and parallel processing system.

Only Sun Microsystems, Inc., the workstation market leader, is currently offering a color workstation for less than $4,000, while vendors such as Hewlett-Packard Co. sell gray-scale, diskless machines near that price point.

**A real workhorse**

IBM hopes its new RS/6000s will fuel continued growth in open systems

Installed base units




Source: Computer Intelligence/Infocorp

"This announcement is one more instance of IBM maintaining its credibility. They don't have a free ride anymore," said George Weiss, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn.

Weiss and other analysts said a strong commitment to open systems is crucial to IBM's future because so many of the firm's clients are moving to multivendor, client/server environments.

Despite the shadow of IBM's looming financial difficulties, several RS/6000 users expressed confidence in the direction of the Unix-based workstation and server line.

"Every six months, IBM has significantly improved their price/performance," said William H. Anderson, chief information officer at Prudential Securities, Inc. in New York, which is installing 400 RS/6000s in brokerage offices nationwide. "Between Sun, HP and IBM, we have three vendors that are making the marketplace very desirable for the consumer."

Another large Wall Street cus-

IBM, *page 12*

**Sales force revamp?**

## Akers departure appears to ruffle few feathers

By Johanna Ambrosio
ARMONK, N.Y.

Large IBM customers said they foresee no immediate changes in their relationships with IBM as a result of last week's sudden announcement that John Akers will retire as IBM's chairman as soon as a successor is named.

IBM's John Akers

"I don't feel that it makes any difference at all," said Bill Sheehan, project leader at Stone & Webster Engineering Corp. in Boston. "I didn't trade in my General Motors car when Stempel left GM. John Akers' leaving is between the board and him."

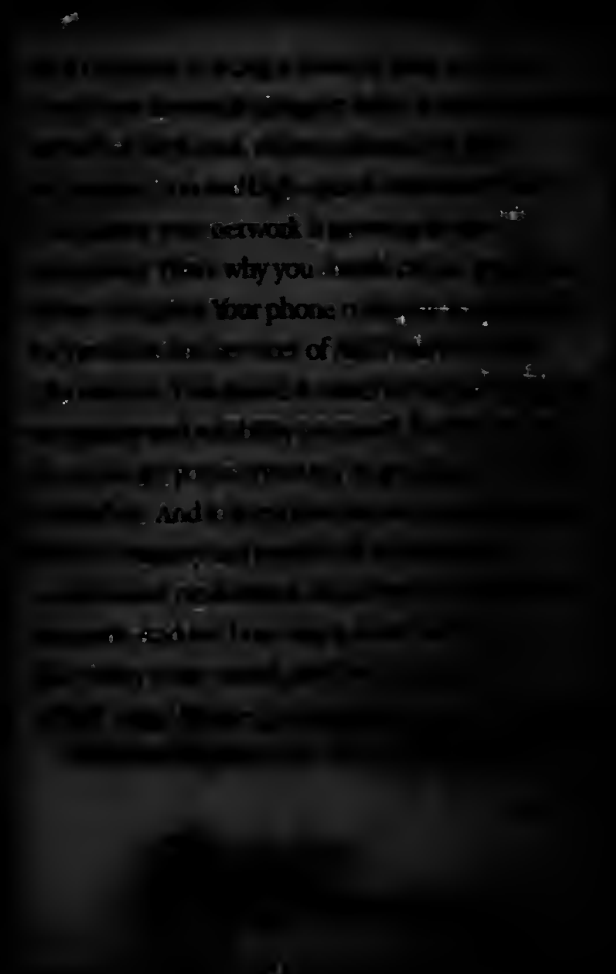
Some of the largely unruffled customers greeted the news as evidence of a revitalized IBM. But some industry watchers warned

Akers, *page 14*

Newspaper

# Are You

# Ready?



## NEWS

**It's been a busy month for IBM** and IBM watchers alike. Last week came the sudden resignation of Chairman and CEO John Akers, followed by the birth of a search committee to find his replacement. And there is some concern that IBM might go back to fielding separate sales forces. This week, IBM unveils its cheapest ever Unix color workstation, along with performance boosts for other systems, in an aggressive bid to keep the RS/6000 line competitive. Meanwhile, Big Blue's storage business, Adstar, is expected to weather R&D cutbacks and a tough business climate. *Pages 1, 12, 14, 15 and 59*

**Comnet '93 will offer** the tantalizing specter of commercial implementation of truly integrated, multivendor network management as both HP's OpenView and Open Network Management Forum's CMIP talk about increasing vendor support for their approaches. Separately, IBM will preview a Blueprint specification that promises to help limit the number of transport protocols needed on the internetwork. *Page 8*

**Software deliveries and distribution** were recurring themes last week as a host of vendors worked to mollify impatient users. Microsoft unveiled a new pricing plan for large sites that offers the flexibility users have been clamoring for. Borland users finally received Paradox for Windows, while Oracle and Lotus users had to settle for half a glass. Oracle is shipping Oracle 7, but two other application development tools won't arrive until the summer. And to ship Notes 3.0 on time, Lotus will cut features promised in the initial release of Version 3.0. *Pages 1 and 4*

## VIEWPOINT

**A look back** at John Akers' own prescriptions for a healthy IBM from interviews past. *Page 28*

## IN DEPTH

**Client/server development tools** are not all created equal. Some excel at the creation of sexy GUIs, while others are best for cross-platform work. *Page 83*

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# DEC still a work in progress

By Melinda-Carol Ballou
MAYNARD, MASS.

Digital Equipment Corp. is in the final stages of realigning its product portfolio, as indicated by a confidential memo concerning expected reductions in software that was released internally last week. But some industry analysts are concerned that these decisions do not go far enough and are not being implemented fast enough to give the company the boost it needs to return quickly to profitability.

According to the memo, which was sent out to company managers and some employees, a series of eight products will be retired.

Fifty others are under consideration for a range of options, such as acquisition by third parties or cuts in funding, according to internal sources familiar with the process. Key products include DECimaging applications and other end-user software products, such as Browser for Windows and DOS and Mobilizer for DOS.

Sharon Kiellor, DEC's vice president of business and marketing management for software, insisted this list is "work in progress" and that decisions will not be finalized until customers have been informed.

Users and analysts, on the other hand, were more surprised by the lack of products cited than by the specific ones targeted in the memo.

"The specific products were not a surprise to me; the big surprise was that the list is so short," said David Frydenlund, sessions notes chairman of Digital Equipment Computer Users Society (DECUS).

"A small number of people will be bitterly disappointed, but there's not a substantial customer base behind them," added Kevin Kindschuh, chairman of DECUS' electronic publishing special interest group.

Industry analysts said the cuts do not go far enough, as DEC seeks to regain profitability and refocus its efforts. "It's a good start, but they're a long ways from the finish. . . . They don't want to alienate [users], but they have to go further," said Chris Christiansen, a director at International Data Corp., a market research firm based in Framingham, Mass.

Ultimately, decisions about which products will be supported and pushed by DEC engineering groups will be driven by a new company-wide structure that goes into full effect in July, the beginning of the next fiscal year.

Then, each of DEC's nine business units will determine cost structures in conjunction with 13 geographical groups, according to Arianna Stadecker, who was appointed vice president of executive operations last week. Those units will then go to engineering with their requests, which will be translated into products.

### On the block

The following DEC products are under consideration for retirement:

- **DECTrellis** — Object-oriented development environment.
- **TeamData** — Database tool.
- **DECimage storage manager** — Stores images.
- **Browser for Windows and DOS** — Data access tool.
- **PathworksLinks** — Provides hypertext linking in Pathworks.
- **Mobilizer for DOS** — Electronic-mail access utility.
- **Vivace** — Desktop application.
- **DECreport** — Report writer.

# News Briefs

### Wang seeks to sell headquarters

Wang Laboratories, Inc. late last week said it is seeking a buyer for its Lowell, Mass., headquarters. Smaller offices in the area are being sought to accommodate a work force that is expected to shrink below the 8,000 threshold targeted last summer, officials said. Wang, meanwhile, disclosed a second-quarter operating loss of $6 million, compared with a profit of $7.8 million last year. The company eked out a net profit of $400,000, benefitting from foreign exchange adjustments. Revenue for the quarter was $351.2 million, off 30% from the comparable period last year.

### DG prevails in suit

A U.S. District Court jury in Boston last week ruled in favor of Data General Corp. in a four-year copyright infringement suit against Grumman Systems Support Corp. DG was awarded $36.4 million in damages and additional interest of approximately $15.9 million. Grumman said it will appeal the verdict. The litigation began in March 1988, when DG sued Grumman for copyright infringement and misappropriation of trade secrets related to its proprietary MV/ADEX diagnostic software. Grumman countersued DG, claiming antitrust violations. The countersuit was dismissed.

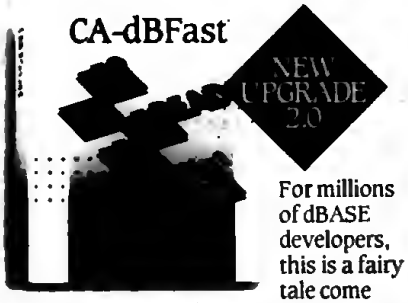
### Stern quits Northern Telecom

Paul G. Stern is resigning as chief executive officer of Northern Telecom Ltd. to pursue other interests such as a new appointment as a visiting executive professor at The Wharton School in Philadelphia. The company's board of directors has appointed Jean C. Monty, president and CEO of the company, to take over for Stern effective March 1.

### Storage Tek shows LAN management software

Storage Technology Corp. in Louisville, Colo., will introduce a storage device next week that can relay data stored on Unix local-area networks to a central automated tape library. Due to be announced at this week's ComNet '93 show in Washington, D.C., NearNet was jointly developed with Epoch Systems, Inc. in Westboro, Mass. The storage device will be priced at about $200,000 and is expected to ship in the second half of the year, according to Storage Tek officials.

# Beauty And dBASE.

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CA-dBFast meets two giant needs: moving existing dBASE applications to Windows *and* developing dazzling new applications in record time. It's the one solution that lets you take advantage of Windows while protecting the huge investment you've made in Xbase technology.

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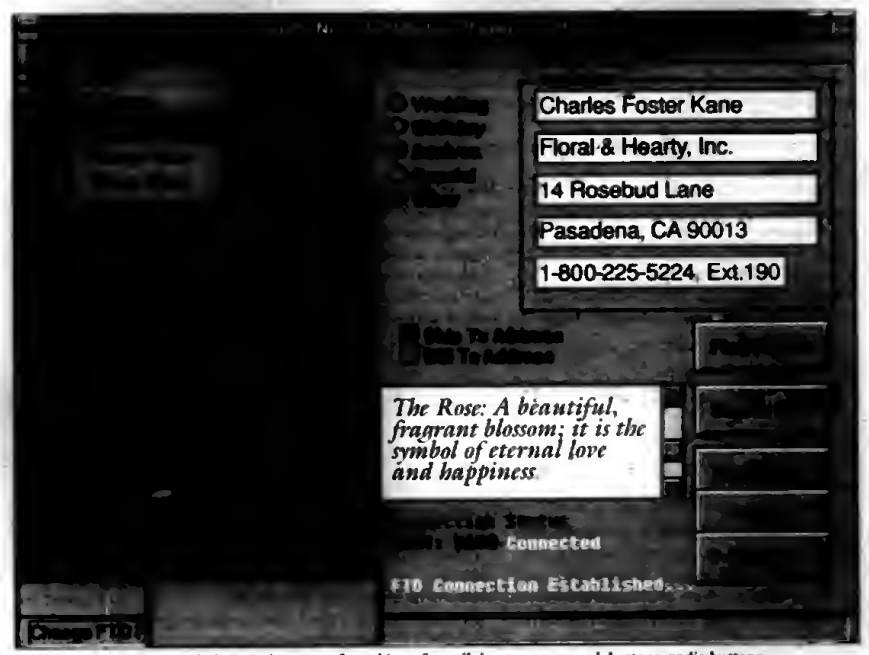
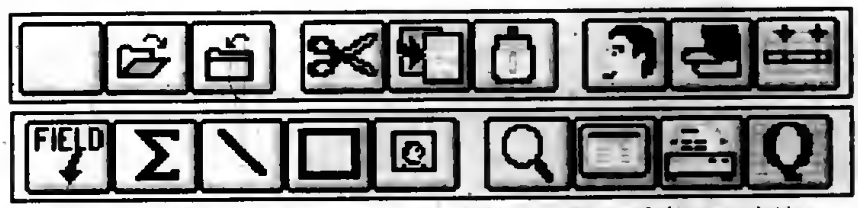



*CA-dBFast includes Windows interface objects for pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes, bit-mapped graphics and more.*

debugger that's so advanced it lets you watch your source code execute at run time – even Single Step through execution.




*CA-dBFast's report writer, CA-RET, lets you mix text, graphics and data to produce great-looking reports in minutes.*

The Visual Application Designer (VAD) makes creating pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes and other Windows objects as easy as "point and click" or "drag and drop." The VAD generates the required source code, saving you hours of complex programming. You also get a

CA-dBFast 2.0 also includes CA-RET – an outstanding Windows-based report writer that lets you mix text, graphics and data on the same report in a full WYSIWYG environment.

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# New CA-dBFast Release 2.0.

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# Lotus to delay some Notes 3.0 features

By Michael Vizard
CAMBRIDGE, MASS.

**Lotus Development Corp. will delay some features initially planned for Notes 3.0, its groupware package, in order to meet its first-quarter delivery commitment, according to George Gilbert, Notes product marketing manager.**

A source close to the company said the Version 3.0 announcement is expected on March 24, although the first shipments could come as early as March 5.

The initial release of Notes 3.0 will focus on support for Apple Computer, Inc. Macintosh clients and improvements to the object-oriented file system that forms the basis of the Notes database architecture. It will also include a text-retrieval engine from Verity, Inc. in Mountain View, Calif.

Among the promised features that will trail the first release of Notes 3.0 are support for Microsoft Corp.'s Object Database Connectivity interface, a derivative of the SQL Access standard, and the integration of work-flow software from Action Technologies, Inc. in Alameda, Calif., Gilbert said. Unix client and server support will also be delayed.

However, Gilbert said support for these capabilities will ship shortly after the initial release of 3.0.

Systems integrators working with Notes said the phased release of Notes 3.0 will ensure that Lotus delivers a stable environment.

"A lot of clients have been waiting for Version 3.0 because they didn't want the hassle of upgrading from Version 2.0 to 3.0. It's really important that Lotus gets this version out, even without some of the features promised," said Eric Wilson, president of Thinking Tools, Inc., a systems integrator in Newton, Mass., that is serving as a beta-test site for Notes 3.0.

"Lotus realizes they will be better off dropping features from the initial release rather than delivering unstable product," said Norman Weizer, president of Weizer Associates, a consulting firm in Lexington, Mass.

### What's featured

According to Gilbert, the major features in the initial release of Notes 3.0 include the ability to support a look-up function from a database field, improved work-flow control software inside the Notes database kernel, the ability to create access-control lists down to the document level and improved support for Microsoft's Object Linking and Embedding protocol, which allows users to employ PC applications such as spreadsheets or word processors in place of the native Notes editor.

The improved work-flow software in the Notes database differs from the Action Technologies software in that the latter package is a layered piece of software designed for large enterprisewide projects, while the work-flow software in Notes concentrates on improving control and tracking documents in the database kernel itself.

The new release of Notes also will support a richer set of macros. "A lot of things that you would do using an API [application programming interface] in Version 2.0 can now be done using macros. This will save a lot of development time when it comes to customizing forms for an application," Wilson said.

According to Gilbert, much of the demand for Notes is being driven by former users of standalone database packages. "A lot of people are using the memo fields in these databases to capture documents. Notes is the reverse of that process in terms of being document-centric, with forms fields attached to the documents," Gilbert said.

**On the bandwagon**

Trellis, a member of the Asset Group in Princeton, N.J., last week joined the Notes bandwagon by offering a systems integration service that will allow Notes users to add voice-annotated messages to Windows applications using Remark, voice integration software from Simpact Associates in San Diego.

# Oracle 7 users await tool kit

By Jean S. Bozman
SAN FRANCISCO

Oracle Corp. had to push hard to get its Oracle 7 relational database management system out the door last month. Now it is pushing even harder to deliver a series of related products that are key to building the next generation of robust client/server applications.

Without a new graphical tool set, which will ship piecemeal from March to June, users will turn to Oracle's character-based tool set or to independent suppliers of Microsoft Corp.'s Windows database tools, analysts said. And without the new version of Oracle's SQLnet communications software, due by June, users will have to program their own client/server protocol translations.

Oracle's CEO Lawrence Ellison: *SQLnet 2.0's absence not holding up customers*

Because the company is pushing so hard on its delivery dates, Oracle Chief Executive Officer Lawrence Ellison told industry analysts last week, a month-by-month shipment schedule is posted outside elevators throughout Oracle's Redwood City, Calif., headquarters.

Industry analysts said Oracle did not give fixed dates for the tool set introduction, but users had expected the SQLnet 2.0 communications software to be packaged with Oracle 7.

While SQLnet 2.0 is an essential ingredient of the next generation of distributed database applications, corporate programmers can start building Oracle 7 code right away, Oracle said. SQLnet 2.0 has built-in protocol translation that reduces the need to write as much application-specific code.

"In practical terms, the difference is in development time and maintainability," said Dale Lowery, director of advanced systems at federal contractor VGS, Inc.

Ellison said the company's integrated set of graphical user interface-based development tools will be introduced next month.

Development problems slowed the progress of Oracle's Cooperative Development Environment tool set, analysts said.

### Up and running

At Oracle's annual analysts meeting here Ellison said the tools are in working order. "We've got a complete integrated tool suite up and running on Windows, the Macintosh, [Sun Microsystems, Inc.'s] OpenLook and even dumb terminals," he said.

SQLnet 2.0's absence is not hurting the company or its customers. "It is not slowing migration to Oracle 7 at all," Ellison said. Users "are not waiting for it, but they sure would like to have it."

But longtime Oracle users said last week that they did not expect the wait. "It was my understanding that [the tools] were being packaged with Oracle 7," said David Kreines, a project manager at Educational Testing Service, Inc. in Princeton, N.J., who chairs the International Oracle Users Group annual conference.

The delay will slow Kreines' plan to combine database servers running Banyan Systems, Inc.'s Vines local-area network protocol with Unix servers; dozens of PCs on the Educational Testing Service campus support only the Vines protocol.

# Paradox for Windows to tackle corporate projects

By Christopher Lindquist
SCOTTS VALLEY, CALIF.

Borland International, Inc.'s new flagship, Paradox for Windows, has finally set sail. All that remains to be seen is how well it floats in the increasingly choppy database market waters — especially because it was launched in the wake of Microsoft Corp.'s fast-selling and low-priced (if a bit leaky) Access.

Users and analysts contacted last week said Paradox for Windows is a first-class product. Borland, meanwhile, said the database will target those customers who are most likely to notice the subtle, but important, differences between it and other products on the market — for example, corporate developers.

"We're not going to position it as a low-end, entry-level toy," said Dave Watkins, Borland's vice president of product marketing. Instead, he said, Paradox for Windows will be positioned as "a powerful relational database that corporations can standardize on," with temporarily low-end pricing.

One company looking to standardize on the product is Paramount Pictures in Hollywood, but not without some reservations, according to senior analyst David Rolston. Among them is the fact that the drivers necessary for SQL access are not yet available.

While Borland has promised the first set of drivers — for Oracle Corp., Sybase, Inc. and Interbase Software Group servers — within three to six months, Rolston said he is taking a "wait-and-see" attitude, given Borland's recent history of shipping products late. Paradox for Windows was initially slated for release last summer.

One analyst said the lack of SQL drivers could prove detrimental to Paradox for Windows' initial corporate push, turning off the very developers Borland is targeting. "Future promises are not going to sell against Access," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago. While Access' SQL abilities are weak, at least they are there, he said.

Beyond that, Paradox appears to be a much better architected product than Access in terms of future extensibility and flexibility, according to Finkelstein.

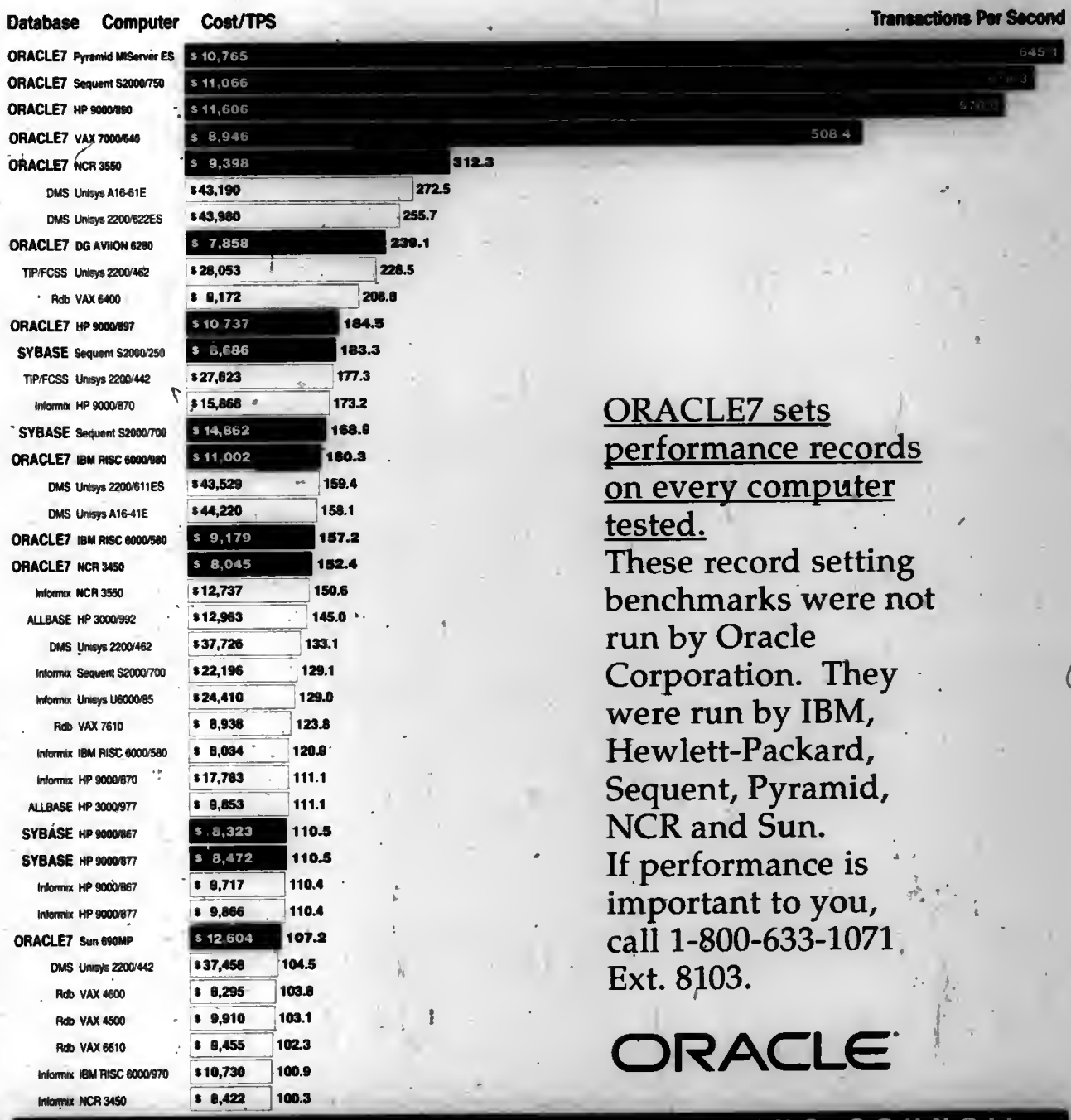
Rolston's general impression of the database seemed to bear that out. He said he believes Paradox for Windows is superior to anything he has seen on the market, including Paradox for DOS.

Paradox for Windows is available until April 30 for $139.95.

# PERFORMANCE COMPARISON

# SYBASE BEST: 183 TPS

# ORACLE7 BEST: 645 TPS

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## News Shorts

### Unisys plans new PC line

**Unisys Corp.** this week will roll out a new line of PCs, workstations and entry-level servers. The PW2 Advantage Plus systems include Intel Corp. 1486 microprocessors that were designed to support Intel's upcoming Pentium chip. The desktop Model 4333 and the six-slot Model 4666, with prices starting at $2,899 and $3,499, respectively, are available now.

### Covia heads for Solaris

**Sun Microsystems Computer Corp.**, the hardware subsidiary of Sun Microsystems, Inc., and **Covia Technologies, Inc.** announced that Covia will port its Communications Integrator software to Sun's Solaris operating system by next fall. Covia's multivendor, message-based software for distributed processing will allow Sun systems to interoperate with other platforms running the Integrator software.

### DARPA pushes fiber nets

**The Defense Advanced Research Projects Agency** (DARPA) formed the Optical Networks Technology Consortium, a government-industry alliance, to conduct research and develop prototypes for all optical telecommunications networks. DARPA contributed $7 million in funding.

### Seagate gets into flash memory

**Seagate Technology, Inc.** bought a 25% stake in flash memory maker **Sundisk Corp.** Sundisk is currently the only company able to ship flash memory cards. The privately held firm's sales are estimated at $25 million.

### Executive leaves MicroAge

William C. Keiper left his job as president and chief operating officer at Tempe, Ariz., reseller **MicroAge, Inc.** to take the same position at Tucson-based **Artisoft, Inc.**, maker of LANtastic. Jeffrey D. McKeever, MicroAge's chairman and chief executive officer, will take over Keiper's role.

### Printers go green

The Clinton administration got cracking on the environment last week when the Environmental Protection Agency teamed with leading industry companies to unveil an energy efficiency program for computer printers. The Energy Star platform was designed to encourage the use of energy-saving features or power management software.

**SHORT TAKES** **Novell, Inc.** and **Saber Software, Inc.** have announced that Novell will bundle a subset of the Saber Menus for DOS, a widely used menuing system, with its forthcoming NetWare 4.0 local-area network operating system. . . **Texas Instruments, Inc.** and **Hitachi Ltd.** have agreed to do joint research and development on a 256M-bit memory chip. . . . **Computer Associates International, Inc.** plans to port its CA-Unicenter, CA-IDMS, CA-Datacom and Masterpiece financial software to **Data General Corp.**'s Aviion servers running under Unix. . . . **Corporate Software, Inc.** extended its PC service program to include 24-hour telephone support for PC and Apple Computer, Inc.'s Macintosh application software. . . . **IBM** consolidated its federal government marketing and support staff within its Federal Systems Co. . . . **Pacific Bell** laid out a plan for converting all of California's 14 million-line telephone network to digital services by 1997. . . . **Ericsson GE** slashed the price of its 1-pound wireless Mobidem Portable Wireless Modem from $1,395 to $775 and cut the price of its wireless electronic-mail package from $1,995 to $995. . . . Elmer Baum, whose loan help fund Apple's beginnings, has died at age 75.

# Brokerage overhauls net

## Frame relays could result in eightfold increase in power

By Joanie M. Wexler
WEEHAWKEN, N.J.

PaineWebber, Inc. last week disclosed that it is embarking on a two-year overhaul of its communications infrastructure that hinges on nationwide frame-relay networking — a pioneering move on Wall Street.

The network overhaul is being driven by a corporate shift to local-area networks — which also largely got under way last week — in the firm's 275 branches. The new network should increase the power of PaineWebber's corporate internetwork eightfold without the firm having to shell out any bottom-line cash, according to the company.

This is because the bandwidth-conserving nature of frame relay and the consolidation of several existing networks should cancel out network upgrade expenses, said Thomas Randall, corporate vice president of communications.

The securities firm intends to merge a 9.6K bit/sec. multipoint mainframe-based network with myriad Quotron Systems, Inc. data feeds, which supply brokers with continual market information, onto a 64K bit/sec., router-based information highway, Randall said.

> "We didn't have time to stop the business of PaineWebber while we built a new network," said Thomas Randall corporate vice president of communications

The networks will come together on a Network Equipment Technologies, Inc. (NET) private backbone that PaineWebber is upgrading to frame relay for $2.3 million and linking into its AT&T Tariff 12 network.

Frame relay's most touted application is for interconnecting LANs because it efficiently handles "bursts" of data traffic when files are transmitted.

**PaineWebber's Robert Benmosche:** *Goal is to be 'independent from the vendors we do business with'*

In addition, broadcasting Quotron data across the corporate network just once rather than fonting the bill for separate feeds to each of PaineWebber's branches is obviously more economical, Randall said. The Quotron network consolidation is slated for 1994.

The network design also jibes with PaineWebber's goal to become "independent from the vendors we do business with," said Robert Benmosche, executive vice president and director of operations, systems and administration. For example, in the new scenario, "if something happens to Quotron, we can just ping in another [vendor's] feed, and we're up and running."

Moving to the LAN platform also speaks to vendor independence, Benmosche said. IBM RISC System/6000-based LANs will support 5,000 Personal System/2 broker workstations running Microsoft Corp. Windows-driven Quotron applications. The shift from standalone Quotron 1000 platforms to an "open" Windows environment ensures that "as technology evolves quickly, we can leverage what's going on in the industry," Benmosche said.

Fortunately, NET's scheme for allowing its Integrated Digital Network Exchange multiplexers to support frame relay via an add-in card means the PaineWebber backbone can straddle the new and old networking environments while the company is in transition.

"We didn't have time to stop the business of PaineWebber while we built a new network," Randall said.

### Poach approach

Another reason behind choosing frame relay is the technology's inherent ability to let users "poach" on other users' assigned bandwidth when it is not being used. The frame-relay network automatically knows to throttle that bandwidth back when the "real" user wants to transmit.

Also, Randall and Benmosche said they consider frame relay a migratory step toward Asynchronous Transfer Mode (ATM) networking, an emerging switched technology more appropriate for delay-sensitive voice and video.

PaineWebber's close relationship with AT&T as its long-distance provider is one reason the firm elected to use Cisco Systems, Inc. rather than NET multiprotocol routers for its backbone. Cisco and AT&T, along with StrataCom, Inc., recently teamed to spur end-to-end ATM networking [CW, Jan. 18].

AT&T said it will introduce its national ATM service this week at the Communication Networks Conference and Exposition '93 in Washington, D.C.

# Emerging fast technology controversy remains

By Lynda Radosevich

Last week's meeting of the IEEE 802.3 committee did not solve the controversy surrounding the media-access layer of the emerging 100M bit/sec. Ethernet standard. However, the committee did agree on a number of physical layer objectives for the fast technology.

Agreement on the objectives means that "we will have something that fits into people's wiring, and we will have something that gets higher speed but is transparent to people's software," said committee chair Pat Thaler.

A vote to retain Carrier Sense Multiple Access/Collision Detection (CSMA/CD) as the media access layer — supported by vendors including Cabletron Systems, Inc., Chipcom Corp., Grand Junction Networks, Inc., Intel Corp., LAN Media Corp., Synoptics Communications, Inc. and 3Com Corp. — did not receive the 75% support it needed to settle the issue, according to Thaler.

The result is that other non-CSMA/CD standards, such as one proposed by Hewlett-Packard Co., AT&T and Ungermann-Bass, Inc., will be considered.

The committee did agree on the following objectives: a maximum distance of 100 meters between hubs and stations, support for the Ethernet shielded and unshielded twisted-pair wiring schemes, specification for a media-independent interface, emissions requirements similar to 802.3 standards and frame format identical to the 802.3 format.

# Microsoft sued over DOS data compression

By Christopher Lindquist
REDWOOD CITY, CALIF.

PC data compression leader Stac Electronics, Inc. jabbed at Microsoft Corp. last week by unveiling a compression standard designed to compete head-on with the Microsoft Real-time Compression Interface (MRCI). Stac then followed with an uppercut — a patent infringement suit — that if successful, could land more than a glancing blow on Microsoft's plans for MS-DOS 6.0.

The suit targets Microsoft's DoubleSpace integrated data compression technology, which is slated to be included with the as-yet unreleased MS-DOS 6.0. Stac is asking for unspecified monetary damages and for Microsoft to cease infringing on the patent, essentially by removing infringing code allegedly built into MS-DOS 6.0. No court date has been set.

Should Microsoft lose the case and be found to have willfully infringed on Stac's patent, the Redmond, Wash., software giant would be liable for treble damages and a reasonable royalty, according to Tom Villeneuve, head of the technology group at Brobeck Phleger & Harrison, a law firm in San Francisco.

However, he noted that patent cases are usually settled out of court to avoid the normal two- to three-year resolution times.

The altercation started after Microsoft announced MRCI and a development tool kit that the company hoped would establish the compression method as an industry standard. The same day, Stac President Gary Clow revealed that Stac was releasing its own standard and that it had filed a patent infringement suit against Microsoft in a California district court.

> Clow said talks fell apart when Microsoft appeared unwilling to offer a suitable royalty arrangement and when Microsoft reps began making "veiled threats" concerning using a competitor's technology.

According to Clow, the suit claimed that Microsoft knowingly infringed on Stac's patents for data compression when it integrated DoubleSpace compression technology into the recent beta-test release of MS-DOS 6.0.

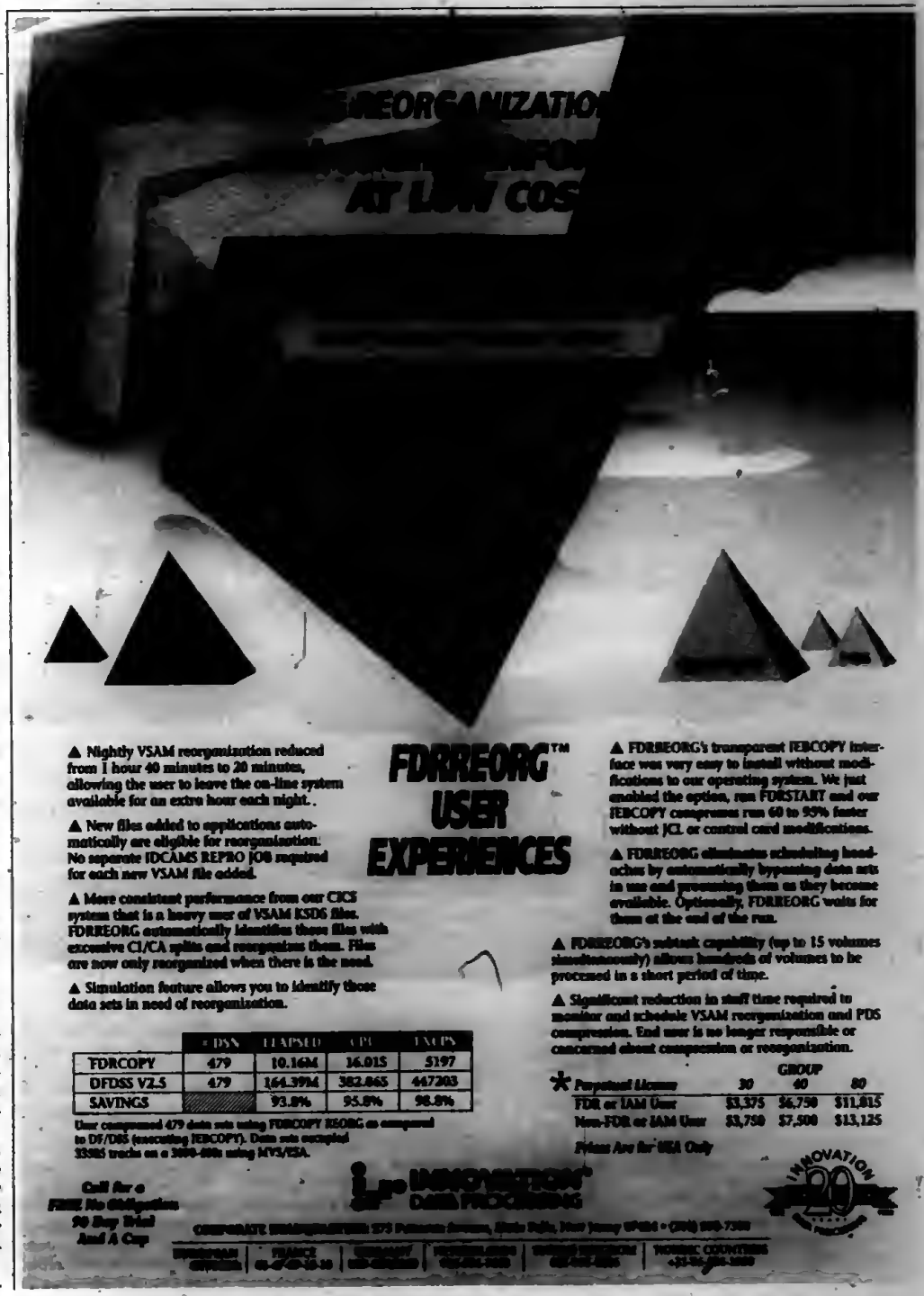
Clow said Stac and Microsoft had been in periodic discussions concerning the possible licensing of Stac technology for use in DOS products ever since Microsoft President and Chief Executive Officer Bill Gates approached Clow at Comdex/Fall '90.

Clow said the talks fell apart when Microsoft appeared unwilling to offer a suitable royalty arrangement and when Microsoft representatives began making "veiled threats" concerning what would happen to Stac's market if Microsoft were to use a competitor's technology.

Clow also said that Stac has been cooperating with the Federal Trade Commission's (FTC) investigation of Microsoft since the final talks broke down. He did not comment on whether Stac had approached the FTC or vice versa.

MS-DOS general manager Brad Chase confirmed that his company had been in discussions with Stac and "a lot of vendors" about compression products, but he refused to comment further.

He also denied that DoubleSpace infringed on Stac's patent and stated that the compression technology in the Microsoft product was largely a result of the company's own development effort, though there was some third-party involvement by a company other than Stac.

# IBM Blueprint to attack net chaos

By Elisabeth Horwitt
WASHINGTON, D.C.

**■ IBM will demonstrate at Communication Networks Conference and Exposition '93 next week the next phase of its Blueprint for Networking strategy, which is expected to provide some degree of transport independence for applications communicating over an enterprise internetwork backbone. Blueprint's release is due next month.**

The ability to help customers create "a transport-independent infrastructure" will be a "real competitive advantage" to IBM as more and more users mix Systems Network Architecture (SNA) with a variety of local-area network protocols, according to Dick Boyle, a program director at Gartner Group, Inc. in Stamford, Conn.

IBM's Multi-Protocol Transport Networking (MPTN) software will take data streams from an application written to one type of transport protocol and translate them so they can work over another type of network, said IBM's lead MPTN architect, Diane Posefsky.

Both IBM and popular LAN protocols will be supported. This in turn will enable users to simplify their management chores by choosing one type of transport for all their applications, regardless of what those applications originally suported, Posefsky added.

One piece of the initial software will let Transmission Control Protocol/Internet Protocol (TCP/IP) Sockets applications talk SNA, Posefsky said. This will enable Unix systems to communicate over an SNA backbone so that customers can avoid having to "introduce TCP/IP" into the corporate network mix, she added.

The second initial piece will let SNA-based applications talk TCP/IP, targeting IBM shops that want to migrate to TCP/IP without having to rewrite all of their legacy SNA applications, Posefsky said.

Boeing Computer Services is one IBM customer that is working with the vendor to implement SNA on top of TCP/IP, via MPTN, IBM confirmed.

**Other protocols to come...**

Subsequent MPTN releases will support translation across other types of transport, including NetBIOS, Posefsky said. Other protocols to be supported include Apple Computer, Inc.'s AppleTalk and Novell, Inc.'s IPX, Boyle said. Also to come, probably within the next few months, is support for Digital Equipment Corp.'s DECnet IV, an industry source said.

Industry sources indicated that IBM is likely to begin implementing MPTN on OS/2 systems next month and on the 6611 router later.

Last month, IBM quietly announced a beta test of an OS/2-based MPTN product that allows applications written to the Open Software Foundation's (OSF) Distributed Computing Environment to run over a LAN using NetBIOS, Posefsky said.

Users will be able to implement an MPTN translator either on the end systems or on a gateway that would do the translating for multiple clients, she added.

While MPTN is a step in the right direction, IBM's Blueprint still does not promise "any-to-any" communications for companies such as The Travelers Corp., which uses a combination of TCP/IP, LU6.2 and the OSF's remote procedure calls (RPC), according to Steve Simon, senior telecommunications engineer at the insurance firm.

Posefsky confirmed that IBM's Blueprint still requires that applications be written to the same interface — such as RPC or IBM's Common Protocol Interface for Communications, which speaks to LU6.2 — in order to speak to one another.

## ComNet

**No clear winner**

Less than half of 50 information systems managers surveyed by Salomon Brothers, Inc. said IBM is best suited to offer a solution to integrate LANs and SNA networks. About 34% said Novell is best suited for the job, while 10% said no vendor is equipped to integrate LANs and SNA networks. But only 18% of the respondents said they had evaluated IBM's 6611 multiprotocol router. When asked about their general perceptions of the router, many compared it with a similar product from Cisco Systems, Inc., though 44% said they felt it was inferior.

## Baby Blue

This week at ComNet '93, IBM is expected to announce a much less expensive, slightly less powerful version of AIX NetView/6000 for users who want to manage small networks.

NetView/6000 is IBM's Simple Network Management Protocol-based software for managing Ethernet networks running TCP/IP.

AIX NetView/6000 Entry Version 1 will be priced at $4,500, compared with $15,000 for regular NetView/6000, an IBM spokeswoman said.

The Entry version will have all the features of its elder brother, "or maybe even more," she added.

While The Travelers would be interested in a scaled-down version of NetView/6000, the real cost is the price of the RISC System/6000 it runs on, said Steve Simon, senior telecom engineer at the insurer.

Taking into account hardware costs puts the price of regular NetView/6000 at about $50,000, Simon said.

*—Elisabeth Horwitt*

## CMIP alive and kicking

Several leading T1 switch vendors will use this week's ComNet '93 show to demonstrate that reports of Common Management Information Protocol's (CMIP) demise are exaggerated, if not dead wrong.

Network Equipment Technologies, Inc.; Ascom Timeplex; Newbridge Systems, Inc.; and Telematics International, Inc. are expected to announce commercial availability of products conforming to the Network Management Forum's Omnipoint, which is based on CMIP. The four vendors will also take part in a CMIP-based interoperability demonstration with BT's Concert, said to be the only other CMIP-compliant network management system now on the market.

By announcing CMIP compliance, the switch vendors are aligning with the carrier industry, which has also indicated its support for the Open Systems Interconnect-based standard, according to Ginny Mellinger, a senior analyst at International Data Corp. In contrast, the internetworking and LAN industries are rapidly coalescing around a rival standard, Simple Network Management Protocol (SNMP).

The SNMP standard still lacks features that CMIP provides, BT spokesman Keith Miller said. The next version is expected to correct these omissions.

The Open Software Foundation's Distributed Management Environment promises to bridge the standards. BT, Network Equipment Technologies and others support CMIP and SNMP. BT is also working to link Concert with HP's OpenView and Sun's SunNet Manager via CMIP. *—Elisabeth Horwitt*

# HP's OpenView gathering support

By Elisabeth Horwitt
WASHINGTON, D.C.

Hewlett-Packard Co. is expected to announce a database structure next week it hopes to push through as the industry standard for sharing data across multivendor network management applications.

The company plans by late this year or early 1994 to release an "open database schema" that it will encourage other network management vendors to support, said Scott Safe, an HP marketing manager. "I am not aware of any industry standard body doing this, so we are stepping into the breach," he added.

Leading integrated network management vendors such as Digital Equipment Corp., IBM and Sun Microsystems, Inc. may have other plans. IBM, at least, offers a similar "standard" data structure in SystemView.

Initial support for the database will come from the Premier Partners, four companies that committed last fall to integrating their network management products with OpenView on a deeper level than the average Simple Network Management Protocol link. The partners — including Ki Research, Peregrine Systems, Inc. and Network Edge — extend OpenView's management mandate to DEC, IBM and Novell, Inc. networks, respectively. The fourth partner, Isicad, Inc., offers a combination trouble-ticketing and physical network configuration management package called Command.

**Pass over**

HP's database will enable the partners' applications to pass data back and forth so that, for example, alerts collected across DEC, IBM and Novell networks can generate alerts via HP Event software and generate trouble-tickets via Isicad's Command, Safe said.

In a common scenario, a network administrator, alerted by Ki's OpenDNM of a DECnet server failure, can call up Command to "find out what that server is connected to and what its assets are," an Isicad spokeswoman said.

Support from the above third-party products may make OpenView a viable replacement for rival products, sources said. 3M Co., for example, is looking at managing its DEC networks, if not DEC systems, via a combination of OpenView and Ki's OpenDNM product, said Chris Amley, a lead telecommunications analyst at 3M.

HP's common data structure is potentially useful to 3M, which uses OpenView to manage its internetwork and is evaluating both Peregrine's and Ki's OpenView-compatible products, Amley said.

However, 3M would like to integrate not only Isicad's Command but also its own legacy IBM Info Man trouble-ticketing system with OpenView, Amley said. The fact that even "open" platforms such as OpenView still integrate only a limited set of applications shows how far the industry still is from a universally supported network management standard, he said.

HP is also aggressively migrating OpenView onto its rivals' turfs: The product now runs on IBM AIX and Sun Microsystems, Inc. SPARCstations.

Furthermore, DEC VMS and Ultrix versions are in the pipeline, an industry source said.

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# Server maker targets supercomputing

By Maryfran Johnson
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc. weighed in on the low end of the supercomputing market last week with a pair of high-performance servers aimed at scientists and technical professionals unable to afford multimillion-dollar supercomputers.

Starting at $120,000, the Power Challenge line of shared-memory symmetric multiprocessing systems is based on a 64-bit Mips Technologies, Inc. processor called TRP, or True Floating Point.

The machines, which will not be available until the first half of 1994, are expected to challenge vendors such as Cray Research, Inc. and Convex Compnter Corp.

"This represents a real change in the way people are putting supercomputers together," said Ken Anderson, co-publisher nf "The Anderson Report" newsletter. "Rather than having dedicated, special-purpose kinds of machines, they combine groups of standard workstationlike processors with symmetric multiprocessing technology."

**Your pick**
The Power Challenge deskside system, priced from $120,000, will have two to six TFP processors. The Power Challenge XL rack system, with two to 18 TFP processors, will be priced from $170,000.

Based on Silicon Graphics' own measurement, the new line hits a peak performance of 5.4 billion floating-point operations per second; nffering a jump in power and speed over Silicon Graphics' current server line. One manager likened the difference to flying from San Francisco to New York in seven minutes instead of five hours.

The systems will run the next version of the firm's Irix Unix operating system.

But nne missing piece of the application scenario is the suite of development tools needed to build software that takes best advantage of the Power Challenge architecture.

"They are going to make those tools available, but we don't know how good they'll be," said Ted Krum, an analyst at D. H. Brown Associates in Port Chester, N.Y. "For low-end supercomputing situations, these systems have much better cost/performance. There is definitely a chunk of the snpercomputing world that will be attracted, but there will always be a sector fnr which there's never enough

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# Supercomputer guru suffers setback

By Ellis Booker
EAU CLAIRE, WIS.

After five years and more than $100 million invested by IBM, Supercomputer Systems, Inc. ran out nf time and money last week, ceasing nperations without ever prodncing a commercial product.

Rnn by the legendary computer designer Steve S. Chen, Supercomputer Systems' mission was to bring forth the world's fastest vector supercomputer. Even as doubts began to surface about the company's future, the aura of mystery around both the venture and Chen continned to fascinate those in the high-performance computing community.

But last Mnnday, the supercomputing guru told the company's 320 employees that the firm was halting operations and providing 60 days nf benefits. "Your technical achievements hove been extraordinary, and I thank you," Chen said. He also announced that a working prototype of the SS-1 had run benchmarks under the nperating system at 2.5 nsec, "producing the world's highest performance for a single processor."

A spokesman confirmed last week that Chen would continue a worldwide search fnr $60 million tn complete the development and manufacturing of the SS-1.

But industry analysts were doubtful this effort would succeed, nnting that users are moving away from single-processor systems tn multiprocessors.

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*Offloading Mainframe Development and Maintenance*

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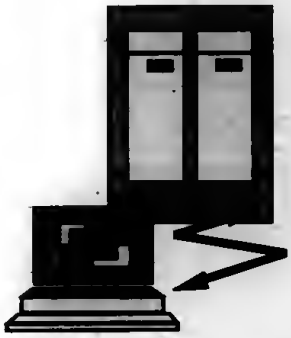
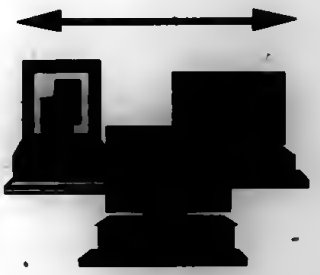


*Client/Server Computing*



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GSA Contract Number GS00K90AGS5251-PS02.

# OS/2 components unbundled

By Kim S. Nash
SAN JOSE, CALIF.

IBM finally got around to prying apart OS/2's database and communications facilities last week, opening up client/server options for OS/2 users and making good on a 2-year-old promise to sell the components separately.

Some users and analysts were underwhelmed by IBM's insistence that the uncoupling demonstrates a "strong commitment" to client/server computing because OS/2 systems can now be configured as database or applications servers or communications links.

Organizations such as the Federal Reserve Bank of Chicago questioned the extent to which separating the products opens them to heterogeneous client/server computing, as IBM claimed.

Piecemeal availability of a 32-bit database and various networking tools does give users more leeway for creating customized — and possibly less expensive — OS/2-based client/server schemes. IBM also enhanced the products, adding remote systems administration to DB2/2, the OS/2 2.0 database, to make it easier to use on a local-area network, for example. Questions remain, however, about how easily the products work with non-IBM systems and whether IBM has made client/server strides.

**Key products**

- **DB2/2**, a 32-bit database based on OS/2 Extended Edition Database Manager, is said to have mainframe-class security and processing power.
- **Communications Manager/2**, a refurbished version of OS/2 Extended Services communications software, supports up to 26 — rather than 16 — concurrent sessions on three hosts and works with Integrated Services Digital Network Basic Rate Interface switched digital links at total speeds of up to 144K bit/sec.

### Waste not, want not

The per-piece pricing strategy means users will no longer have to buy more than they need, according to Richard Belles, program director at IBM's Enterprise Information Group (see chart).

But users who want to buy all three components will pay a higher price than before the unbundling, noted Eric Jones, manager of technology services at the Department of Transportation in Phoenix.

IBM took its time coming out with DB2/2, time that relational database rivals used to cut into territory once dominated by its big iron sibling DB2, analysts said. DB2/2 is "a competitive database, but they haven't done anything that doesn't already exist with Oracle, Sybase or others," said Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass.

Still, DB2/2 gives mainframe DB2 users a "cleaner" migration option with which to move applications to smaller platforms, Hurwitz said. DB2 users will like the downsized DB2/2's ability to speak SQL, she added.

The Federal Reserve branch in Chicago, which is rolling out OS/2 to 70 local users, plans to start evaluating databases for downsizing a major economic analysis application now running on an IBM 3090 mainframe. However, the bank's extensive Novell, Inc. network "limits where we look," said Scott Johnson, systems analyst.

Just which environments DB2/2 and Communications Manager/2 work with is a sticking point, according to Neil Hill, an analyst at Forrester Research, Inc. in Cambridge, Mass. "IBM is breaking out the products, but they haven't said a thing about making them run on operating systems other than OS/2," Hill pointed out.

**Mix & match**

IBM is unbundling OS/2 to take advantage of emerging client/server requirements

| | Before | After |
|---|---|---|
| Communications Manager (stand-alone) | $595 | $475 |
| Database Manager (stand-alone) | | $425 |
| Database Manager (server) | $1,995 plus $75/user | $2,495 plus $75/user |
| Communications Manager (server) | | $1,995 plus $95/user |

(CW Chart: Michael Siggins)

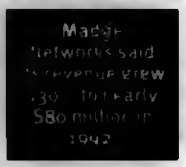
# Madge boosts LAN speed

By Lynda Radosevich
SAN JOSE, CALIF.

Two Token Ring products soon to be released by Madge Networks, Inc. are aimed at helping users get the highest speeds possible out of their 16M bit/sec. local-area networks.

What is driving this technology is not that users are hitting the wall with their 16M bit/sec. Token Rings. Instead, Madge is anticipating that users will move to faster operating systems such as Microsoft Corp.'s Windows NT, said Charlie Robbins, director of communications research at Aberdeen Group in Boston.

Madge acknowledged that it plans to one-up IBM by announcing in several weeks the first 32-bit Micro Channel Architecture (MCA) Token Ring adapter card. The card will work with AIX, IBM's implementation of Unix for its RISC System/6000 series of workstations.




"By providing AIX support, we will allow RS/6000 users to get the highest performance out of 16M bit/sec. Token Ring," said Martin Taylor, director of product marketing at Madge.

The company will also announce this week a new version of its FastMac software drivers, which users and analysts agreed considerably speed up the performance of Token Ring products based on Texas Instruments, Inc. chips, such as those from Cabletron Systems, Inc., Cisco Systems, Inc., Hewlett-Packard Co., SynOptics Communications, Inc. and Wellfleet Communications, Inc. The new software, FastMac Plus, will increase the throughput of data packets and deliver speed increases from 10% to 15%, the company said.

Users said they are interested in higher Token Ring performance, mostly in their bridges and routers. However, some said the added capability is more than they currently need, especially running to the desktop.

### Bridge appeal

"I'd be interested in FastMac Plus for bridges, but not for workstations because our rings are well-designed," said Kasey Kasemodel, a network analyst at Mazda Systems Services of North America in Flat Rock, Mich. Mazda started using Token Ring a year ago in manufacturing. At first, it installed IBM cards that "were giving us congestion errors," he said.

For the high-load nodes, he replaced all IBM cards with Madge (FastMac-equipped) adapters. "By replacing the IBM cards, the errors went away. It would be interesting to learn more about FastMac Plus," he added.

For Abbott Laboratories, a pharmaceutical and medical products company in North Chicago, the added performance of Madge's 32-bit MCA adapter for AIX "will be interesting eventually, but at this point, the applications we have don't need that kind of bandwidth," said Mick Schroeder, senior systems analyst. "As we get into graphics and multimedia, users might start banging on doors asking for more bandwidth."

The existing FastMac software has been licensed by many network vendors. Some companies, including Cabletron, HP, Wandel & Golterman Technologies, Inc. and Wellfleet Communications, said they plan to evaluate FastMac Plus and will consider including it in their networking products.

For existing Madge customers, FastMac Plus software is available for free by calling the firm.

# Unix boom

CONTINUED FROM PAGE 1

tomer, PaineWebber, Inc., was also optimistic about the RS/6000. "It is extremely competitive and a real processing engine," said Bob McKinney, executive vice president and CIO at PaineWebber. "The only weak link in the chain that we see is the AIX operating system."

PaineWebber recently began a rollout of 400 RS/6000 Model 340s to its branch offices around the country, and McKinney said the firm has discovered some annoying instabilities in AIX along the way (see story page 6). "If you configure it in a standard, cookie-cutter way for all the branch offices, it's fine," he said. "But once you introduce variable software, it's not quite Unix anymore."

Other users voiced similar complaints about AIX, saying it is difficult to use, overloaded with unnecessary features and clumsy to administer. "They've made it very complicated to deal with," said Bill Duggan, a senior engineer at Stone and Webster Engineering Corp. in Boston.

**New for the RS/6000**

- A new low-end color workstation priced under $4,000.
- A new X Window System terminal with industry-leading performance.
- One higher performance model in the 500 series, plus three new 300 series boxes packaged as ready-to-use technical graphics workstations.
- Enhancements at the high end of the line, plus the formal unveiling of the Power Parallel processing system and an RS/6000 data server.

### Playing favorites?

Some industry observers have also questioned how avidly the sales force pushes the RS/6000 — particularly in comparison to the higher margin, proprietary Application System/400 [CW, Dec. 21].

"I've heard stories about people wanting to buy an RS/6000, but the IBM sales rep wants to sell them an AS/400," said Gary Donnelly, a director at the National Information Technology Center in Rockville, Md. "There may be commitment to open systems up the ladder in IBM, but in the trenches, the salespeople are pushing the products they know best."

IBM's positioning of the $4,000 color workstation should be intriguing to watch, several users said. Any Unix machine, they noted, has an uphill struggle unseating low-end PCs because of the wealth of software available under MS-DOS and Microsoft Corp.'s Windows environments.

PaineWebber, for example, is attaching some 8,000 Personal System/2s running Windows off the RS/6000s going into its branches. Even if an RS/6000 were cheaper than a PS/2, McKinney said, the volume of available applications would swing the decision away from Unix.

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# Departure ruffles few user feathers

CONTINUED FROM PAGE t

customers to gear up for at least one more major change that will probably occur within a few years: a reinstitution of separate sales forces for at least some of IBM's spun-out companies.

While some users said they would grudgingly accept this, others said they are loath to return to the 1970s situation where they had multiple IBM sales representatives banging on their doors.

### Steep learning curve

IBM's new, yet-to-be named chief executive officer will probably not implement any major actions until year's end, analysts said, especially if the new executive comes from outside the industry, as some have predicted. An outsider would face a lengthier learning curve than would an insider (see story page t5).

Meanwhile, many challenges loom. Among them are charting the company's financial turnaround; cutting up to 100,000 more employees; choosing the market niches in which IBM will compete; becoming or staying the lowest cost producer and most effective competitor in those segments; and keeping existing customers happy while wooing others back to the fold.

"IBM needs to regain my business," said Eric Singleton, director of the information services division at the Orange County Property Appraiser's Office in Orlando, Fla. "In the last several years, IBM has not offered anything that is cost-effective or innovative to us. t mean, really — get with the program."

IBM's announcement that it will seek a new chairman had been expected, but the timing caught many industry watchers by surprise. Akers had insisted during the past few months, even as he announced the worst financial results in IBM's history, that he was going to steer the company through its crisis and even stay past IBM's traditional retirement age of 60 to do so.

Most analysts speculated that increased pressure by large stockholders, Wall Street and even the media forced Akers to retire sooner rather than later.

Nevertheless, not much will change for IBM shops. "By the time the strategy filters down to the customer level, it's a long way down the road," said Irwin Bernstein, vice president of planning and administration at Maidenform, Inc. in Bayonne, N.J.

### Stay the course

One possible strategy that will not elicit much enthusiasm in some quarters is any move back to separate sales forces. Most analysts said they believe IBM will continue along its current path of breaking the company up into independently operating companies and, if anything, will speed up the process. It may then be just a matter of time before these independent business units gain their own sales forces, industry watchers said.

"If it were me, with this sense of crisis, I'd make that happen on Jan. 1, t994," said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "They need their own sales forces."

IBM executives, especially marketing head Robert LaBant, have repeatedly insisted that this will not happen because customers reacted so negatively the last time around. Many observers said it is inevitable, although most customers still intensely dislike the idea.

"I am very concerned about that possibility," said Michael Jecko, vice president and director of information systems at The Rouse Co. in Columbia, Md. "The upside of that is you're dealing with more focused people, but t have always felt we received good service from dealing with one person."

Indeed, that is the rub. "IBM spent most of the 1980s trying to recover from the problems of having independent sales forces," said Frank Gens, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

### Plenty of elbow room

"Still, it is difficult for one sales force with hundreds of products in its bag to compete on a skills basis against a Xerox printer or Storage Tek disk salesperson." Gens suggested there is room for something in between a large, generalist sales force and one that sells only PCs.

There will likely be some shorter term fallout from Akers' resignation. "Obviously, IBM competitors will be doing everything they can to get business away from IBM," said Charles Casale, chairman of the Aberdeen Group in Boston.

"The whisper campaigns have already started: 'Gee, they may not be around next year.' And of course it's the ultimate irony because it's the same fear, uncertainty and doubt that IBM used for years on everyone else."

*Correspondent Thomas Hoffman and staff writer Lynda Radosevich contributed to this story.*

## THE AKERS LEGACY

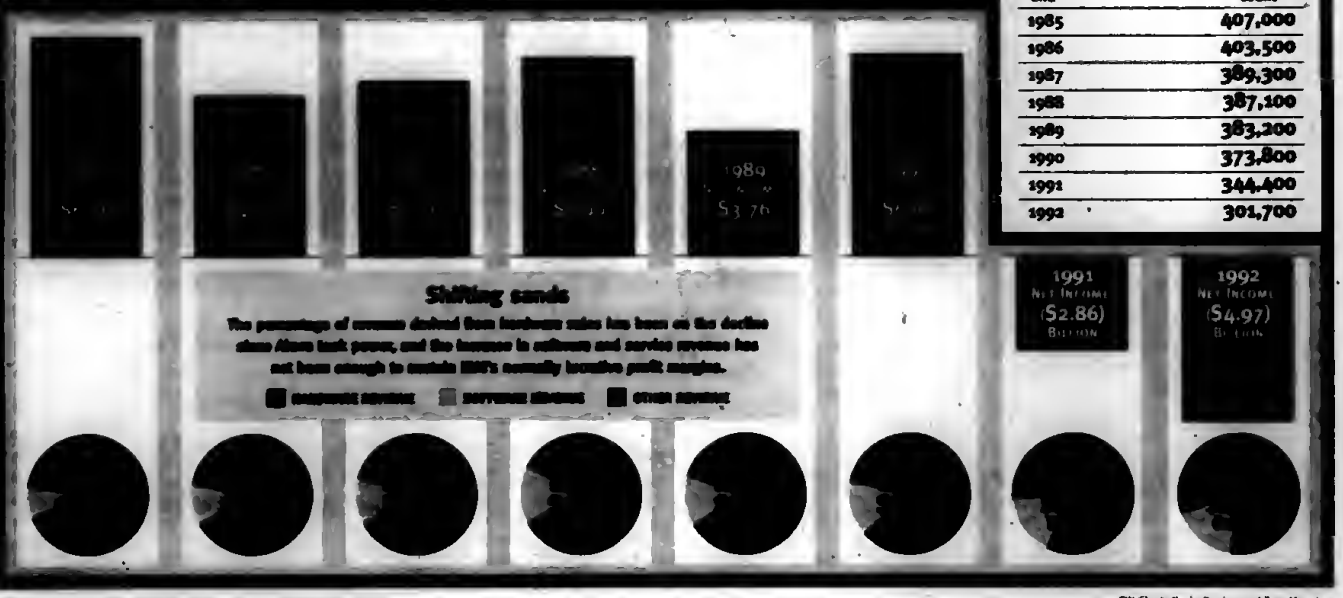
- Joined IBM in 1960.
- Promoted from senior vice president to president in February 1985, became CEO in February 1985 and assumed the chairmanship in June 1986.
- In 1988, he began a reorganization into lines of business that over time will spin IBM into separate companies.
- Under his watch, a series of technology blueprints emerged, starting with SAA, designed to address incompatibilities and shortcomings across IBM's multiple architectures. Except for Information Warehouse, none had a real impact on customers.
- Akers did not move quickly enough, many believe, to cut corporate fat and focus the company in growth areas such as software and services. Losses began to mount in 1991.
- He resigned January 1993 amid pressure from stockholders and others.

IBM

### We're outta here . . .

Since 1986, IBM has initiated 87 different voluntary incentive programs that have reduced headcount by more than 65,000 employees. Managers alone have decreased from 50,000 to 36,000.

| Year end | Employee count |
|---|---|
| 1985 | 407,000 |
| 1986 | 403,500 |
| 1987 | 389,300 |
| 1988 | 387,100 |
| 1989 | 383,200 |
| 1990 | 373,800 |
| 1991 | 344,400 |
| 1992 | 301,700 |




CW Chart: Kevin Burden and Tom Monahan

# Speculation rife on outsider as IBM CEO

By Johanna Ambrosio

The buck stopped with John Akers, and so will the time-honored tradition of selecting IBM's top executive from within the ranks of the company. The troubled giant's next chairman will most likely be from outside IBM, industry watchers said.

"They do need to go outside," said James F. Moore, president of GeoPartners Research, Inc., a Cambridge, Mass., consulting firm. "Everyone senses intuitively that they need someone who can symbolize change."

But the agreement ends there. Some analysts argued for someone with solid computer industry experience who has run — and changed the culture of — a multinational corporation.

Candidates include executives such as former Hewlett-Packard Co. Chief Executive Officer John Young and AT&T's Robert Kavner.

**Financial genius**

Others said it is more important that IBM's next top executive be a tough-minded financial and operational whiz, preferably someone from another industry who could bring an entirely new perspective and help the listing giant focus on new markets and lop off unprofitable ventures.

One potential candidate is John Welch of General Electric Co., who successfully restructured that multibillion-dollar conglomerate by jettisoning businesses in which the company could not successfully compete and investing in those the firm could dominate.

Regardless of who lands the chairman's job, an IBMer may well get the No. 2 spot. This could provide an incentive for the current crop of IBM talent to stay put and would help ensure an orderly transition from the old regime to the new.

Any one of a bevy of newly minted senior vice presidents — PC chief James Cannavino, telecommunications head Ellen Hancock or mainframe guru Nicholas Donofrio — is capable of filling this role.

A seven-person executive search committee, comprising IBM directors, is expected to make its selection in time for IBM's annual meeting in April.

An ideal candidate would have turnaround expertise. For this reason, Unisys Corp. Chairman James Unruh has been mentioned as a dark horse.

However, finding a highly qualified non-IBMer to take the job may be difficult. "The guy who assumes this position assumes high risk," said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn. "Folks who are CEOs or ex-CEOs have success stamped on their forehead, and the guy who takes this job must face the fact that he might not succeed."

## Corrections

Because of an editing error, the article "Point, Click and Play," [CW, Jan. 18] quoted Jonathan Handler as saying he liked OS/2 and Windows for their multithreaded, multitasking capabilities. In fact, the reference should have been to OS/2 and Unix. *Computerworld* regrets the error.

Clarification: Grammatik, the grammar checking software that WordPerfect Corp. recently acquired from Reference Software International, is bundled with Lotus Development Corp.'s Ami Pro 3.0 and Microsoft Corp.'s Word for Windows only in France; in the U.S., it is bundled with WordPerfect for Windows 5.2.

Because of a reporting error, the electronic-mail address for The Corporate Facilitators of Object-Oriented Technology was incorrect in the Jan. 25 issue. The correct address is rmarcus@atc.boeing.com.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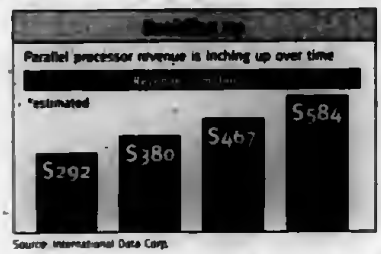
*Computerworld, 1/4/93, Vol. 27, No. 1

# Users taking slow road

CONTINUED FROM PAGE 1

These new microprocessor-based engines offer raw computing performance equivalent to or better than today's mainframes — at a lower cost. For example, current mainframe alternatives from companies such as Hewlett-Packard Co. are selling for as low as $12,000 to $15,000 per million instructions per second (MIPS), while an IBM-class mainframe has a street price of between $50,000 to $55,000 per MIPS, said James Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn.




The hardware direction and its price/performance advantage are clear. But the future large-system platform does not yet provide an answer to IS' burning question: How do you get there from here?

"Very slowly," said Howard Richmond, a director of high-performance computing research at Gartner Group.

The potential rewards of this new generation will be hard won, added several IS executives, computer makers and industry analysts interviewed recently. In short, tremendous software barriers still exist, so most IS shops will have to take small steps toward the new hardware.

But the real dilemma is that the most robust large-system commercial software in the world, IBM's MVS, was not designed to accommodate a full-blown parallel processing architecture. And the operating environment that now handles parallel processing configurations — typically a version of Unix — has two drawbacks: It does not run MVS applications, and even if it could, it does not yet have the full suite of sophisticated systems management tools that are MVS' hallmark.

So, if a customer wants to stay with MVS as the company moves to parallel processing it will have a long journey ahead. IBM will provide dedicated engines as it works toward creating a parallel processing version of MVS, but this is a huge task. Traditional rivals, Amdahl Corp. and Hitachi Data Systems Corp., also have parallel processing projects in the works.

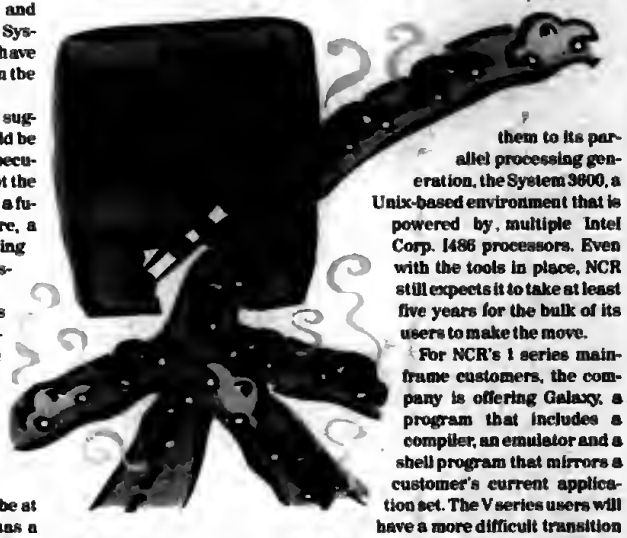
Some analysts have even suggested a brand-new MVS would be required, and at least two speculated that IBM may try to adopt the micro-kernal architecture for a future version. The architecture, a layered approach, is being adapted for its desktop systems.

The current MVS needs work in several key areas, analysts said. For example, the JES component needs a major overhaul so it can juggle work loads that are split among dozens, even hundreds, of processors, Cassell said.

Most observers said it will be at least two years before IBM has a general-purpose version of its 390-based parallel processing engine. Furthermore, they expect users will keep varying degrees of conventional processors in their large-system complexes for the rest of the decade.

"There will be certain applications that will lend themselves to parallel processing and certain ones that don't," said Tom Loane, vice president of IS at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "That's why we will have collections of different engines slung together."

And, if a customer wants to take advantage of a non-IBM platform today, he will take on the risk factor of a less-robust operating environment and the daunting task of converting applications to the new operating environment. Observers said the exception is typically when a user is involved in a re-engineering project and is overhauling software and hardware requirements anyway.



But to avoid the possible pitfalls of moving a standard application to a non-IBM parallel processor, several early adopters of these new engines are using them in conjunction with a mainframe host environment. Such is the case at Kmart Corp., where a database machine from Teradata Corp., now owned by NCR Corp., is successful at processing massive databases but still relies on the host for system services and application processing.

"To my mainframe systems, it looks like a tape drive," said Ed Spreder, director of operations and technical services at Kmart.

Spreder said the database machine, which runs under the Teradata Operating System, does not have a scheduling methodology equivalent to the MVS. While his vendor "has promised to give us as much help as possible," Spreder's staff is required to manage the data engine's work load.

Ultimately, users will have little choice but to slowly evolve to the new generation because of the software hurdles.

NCR is proof of that. The company is already providing its installed base with tools to move them to its parallel processing generation, the System 3600, a Unix-based environment that is powered by multiple Intel Corp. 1486 processors. Even with the tools in place, NCR still expects it to take at least five years for the bulk of its users to make the move.

For NCR's 1 series mainframe customers, the company is offering Galaxy, a program that includes a compiler, an emulator and a shell program that mirrors a customer's current application set. The V series users will have a more difficult transition because of the older technology on which that mainframe is based. Currently, NCR provides connections to link the System 3600 with the older equipment. It is working to improve communications tools, added Ben Barnes, an assistant vice president of worldwide marketing at NCR.

While vendors slowly shift the software environments to these new hardware platforms, users will move forward cautiously. Gartner Group's Richmond estimated that about 20% of the IBM mainframe world will seriously evaluate parallel processing technology this year.

"The concepts of parallel processing make so much sense on paper," said Michael Burwen, president of Palo Alto Management Group, Inc. "But, there are a number of barriers to use those systems, and at this point, it isn't clear if the barriers will be overcome in this decade."

## Parallel processing in the mainstream

**IBM:** Will release parallel processing engines based on a microprocessor version of its 390 technology. Also plans to deliver high-end systems based on its Power RISC chips.

**IBM's long-term plans:** Massively parallel machines with 500+ microprocessors performing at speeds measured in floating-point operations per second and handling more than 1 trillion FLOPS.

**Amdahl:** Building a mainframe-class system based on Sun Microsystems, Inc.'s Scalable Processor Architecture chips. Also plans an "IBM-compatible" machine with CMOS processors.

**Why are mainstream vendors moving to parallel processing machines?**

"If we don't improve the price/performance in light of the other technologies that are out there, the balance between centralized and desktop computing will lean more to the desktop," said David Anderson, Amdahl's vice president of compatible products.

**Hitachi:** Will not provide details other than to say many projects are in the works.

## The little database engine that could

**Commercial parallel processing is finding a home in the database end of IS operations because a database is one of the easier mainstream applications to do in parallel.**

**Typically, multiple simultaneous queries hit a database, and they are often self-contained or unrelated requests. As a result, the database can more easily be split across several processors. Much of the Teradata technology was used to make the more general-purpose NCR 3000 series of parallel processing machines. And IBM will likely grow its database engine to a more general-purpose machine.**

**In contrast, many core IS applications, such as financial programs, were written so the completion of one task was dependent on the results of a previous task. This sequential operation requires a single processor to rapidly fire through each task in a given order.**

***—Rosemary Cafasso***

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*– Macworld, January 1993*

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>
> *–PC Week, September 7, 1992*

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> *–BIS Special Report, August 1992*

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> *–Computerworld, September 21, 1992*

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# Microsoft woos IS, offers flexibility

CONTINUED FROM PAGE 1

at Northern States Power Co., according to Dick Elhardt, administrator of information services for the gas utility in St. Paul, Minn.

The old system required that each building at Northern purchase a separate license, which was difficult for Elhardt to sell to Northern management. Now, because Microsoft Select enables Northern, a program beta-test site, to have one contract for the entire company, "it's so much easier for us to administer," Elhardt said.

It does not hurt that Microsoft is working directly with Elhardt's reseller, DCT Entre, to provide license-tracking services. DCT installs the software for Northern and reports the number of licenses purchased back to Elhardt.

"All I have to do is pay the bill," Elhardt said. In fact, this setup spares him having to track all the licenses himself and leaves him eligible for volume purchase discounts.

Among the current LARs are Corporate Software, Inc., Computerland Corp., Egghead Discount Software and PC Plus Ltd.

A user at a large western utility provides one example of how Microsoft Select can be implemented. This company has worked out an arrangement with its reseller whereby each time a preconfigured machine is purchased, the software licenses are added to the company's overall tally. And when users of existing systems need to purchase a license, they simply send a request to the reseller and copy the software to their PCs.

The user company receives a monthly report on the number of licenses installed and in turn, reports a quarterly figure back to Microsoft.

According to this user, the most important aspect of the arrangement is mutual trust. The reseller must report the licenses accurately and on time, and Microsoft must trust its customers to do the same — something the company seems willing to do.

Despite some early enthusiasm, the program is far from perfect, according to some Microsoft users who asked not to be named. Of particular concern is the fear that having to make two-year projections will lock customers into Microsoft products and reduce flexibility in purchasing decisions.

**Rivals take action**

Microsoft's rivals haven't been sitting on their hands. Borland International, Inc.'s Evaluate, Adopt, Standardize Easily (EASE) program encompasses prerelease availability, volume purchasing discounts and software maintenance. Others, including Lotus Development Corp., are reportedly working on similar programs.

The program is also viewed in some quarters as most beneficial to those companies that standardize fully on Microsoft products and therefore receive the biggest benefits.

"We're still not pleased with the program," said Dave Ness, consulting services manager at the *Washington Post*. "It requires too big a hit and too much of a commitment."

Part of that commitment is the projected purchasing plan. For example, if a Microsoft Variable License Pak buyer does not hit a preset percentage of projected sales in the first year of the contract, the discount is cut back on all further purchases, although previous purchases are not affected.

The situation is slightly different for Microsoft Enterprise License Pak customers: If they do not meet the projected number of licenses, they are required to purchase the remainder at the end of the contract.

Several early adopters commented that most large companies need to standardize on software products if they are to keep support costs reasonable. As such, the projections are not unreasonably difficult to make.

*Senior editor Michael Vizard contributed to this report.*

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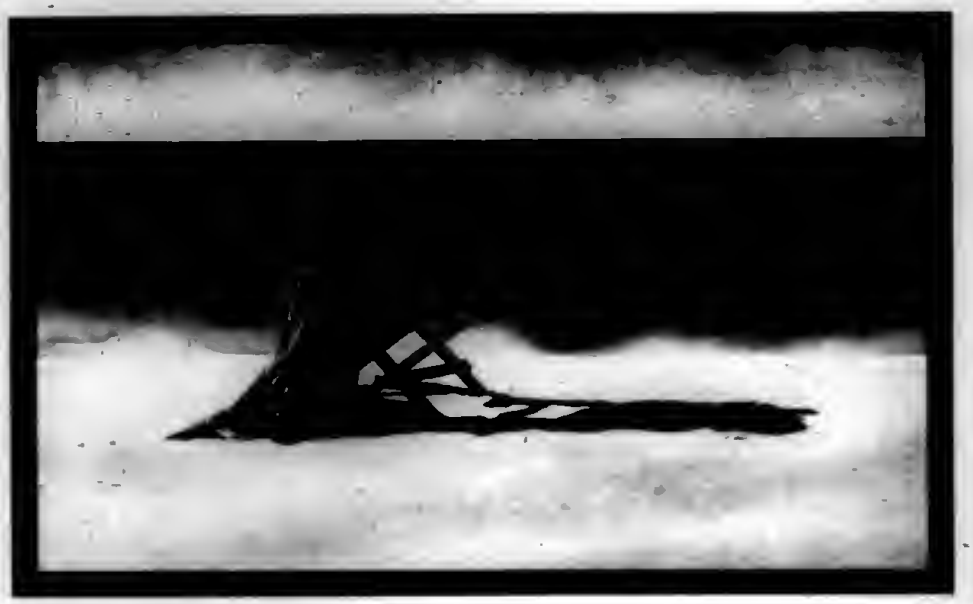

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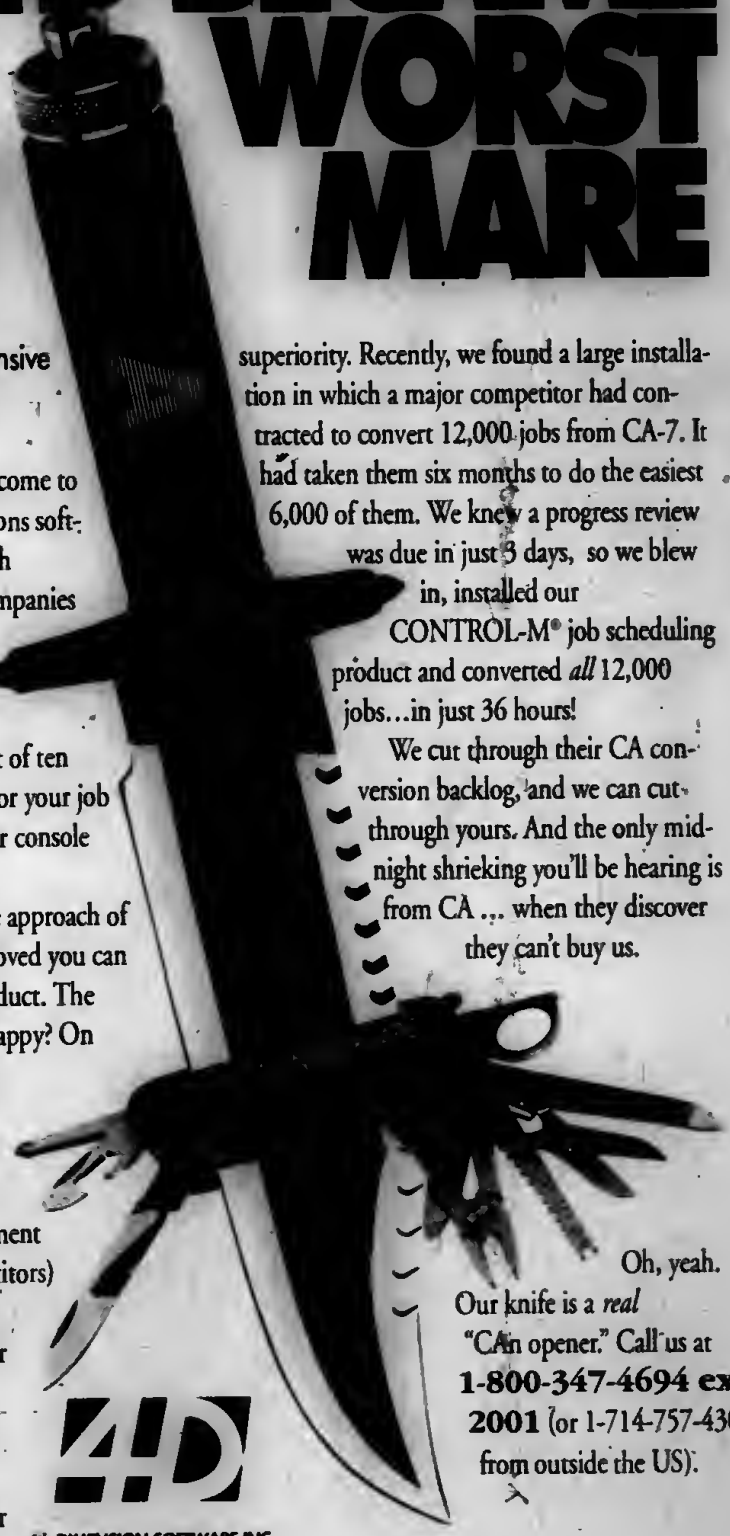

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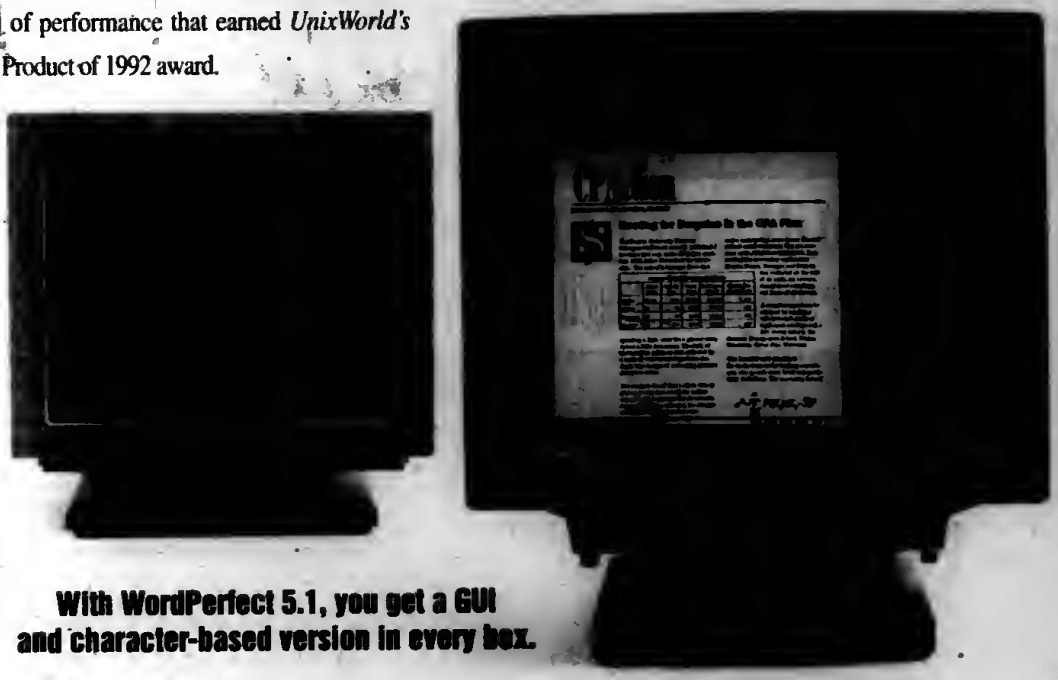

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# Microsoft, Infonet target software tracking

By Michael Vizard
SEATTLE

Microsoft Corp. last week partnered with Infonet Services Corp., a provider of wide-area network services, in a distributed systems management effort designed to simplify the distribution and tracking of PC applications software.

Code-named Hermes, the Microsoft systems management project uses Microsoft's SQL Server database running under Windows NT to track the configurations and software running on every PC on the network. An information systems director would then make use of the functions in the NT distributed operating systems to download PC applications to clients on the network.

Only one copy of Hermes will be required per company, according to Dave Berry, product manager for Microsoft systems management technology. That copy of Hermes records a script for every client on the network, which is linked to code running on the PC that sends configuration data to Hermes. Using this technology, Microsoft will make it much easier to administer its recently announced Microsoft Select program (see story page 1).

**Appealing prospect**

"The idea is extremely intriguing. It would give me virtually unlimited access to my network nodes worldwide," said Brian Anderson, director of information services at Trans Ocean Ltd., a leasing company for container ships in San Bruno, Calif.

"We have a lot of small offices worldwide that we can't afford to have a system staff for. Upgrading software at these offices frequently involves getting on a plane, which usually happens three to four times a year. Hermes would eliminate a lot of those trips," Anderson said.

Eventually, Anderson said, he expects to see Hermes tied into a network management console, which would allow him to perform systems and network management tasks from the same console.

Berry added that he expects Hermes to be used to allow people to travel to remote offices, log on to servers at their home office and have the remote PC dynamically reconfigured to match the configuration of the PC in their home office.

Hermes is scheduled for availability at the end of this year. Pricing has yet to be determined.


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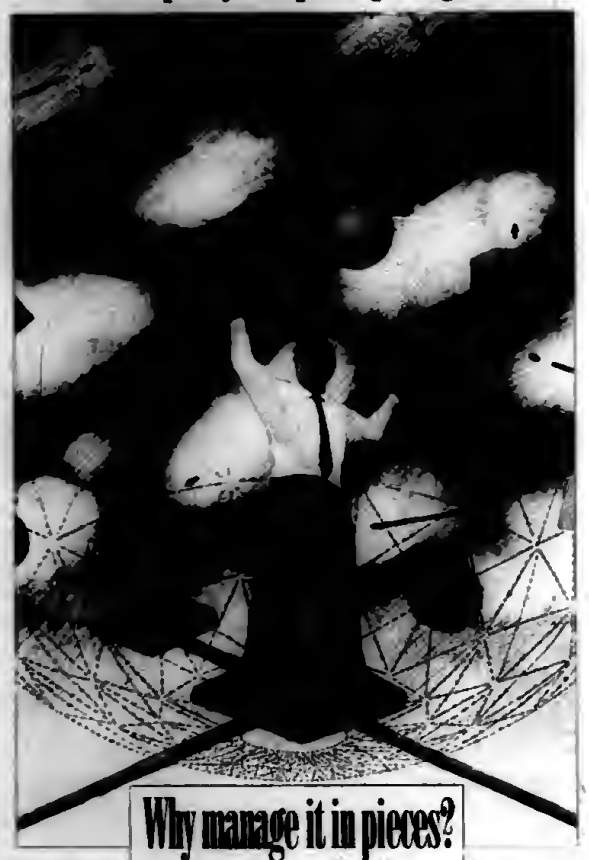

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# 3Com spearheads partnership to standardize support

The internetworking industry took strides last week toward reducing vendor fingerpointing and ensuring multivendor product interoperability *before* customers sign on the dotted line.

A technical support alliance spearheaded by 3Com Corp. in Santa Clara, Calif., has emerged to encourage hub, router and bridge vendors to coalesce around a standard level of service and support.

The move parallels Novell, Inc.'s formation in 1991 of a vendor group charged with fostering cooperation among suppliers whose products run on NetWare.

Companies that have joined 3Com in the partnership so far include Hewlett-Packard Co., IBM, Proteon, Inc., SynOptics Communications, Inc., Ungermann-Bass, Inc. and Wellfleet Communications, Inc.

3Com said it expects the alliance members — slated to meet for the first time at the Interop show next month — to begin elevating the internetworking vendor community's level of expertise and code of conduct by this summer.

Meanwhile, 3Com unbundled two of its professional services — network design and survey/mapping — from its turnkey package to give users more variety in their service and support choices.

*— Joanie M. Wexler*

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# Technohumanities 101

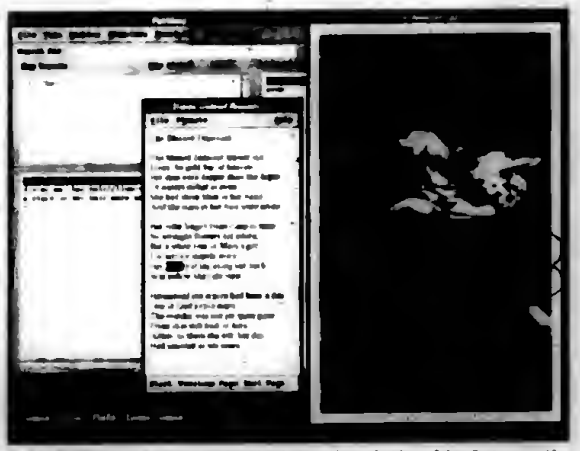
## Scholars are pushing computers in the humanities far beyond their traditional roles

By Gary H. Anthes

It was an integrated yet open environment, one that facilitated the interactive flow of information across disciplinary boundaries.

A recent implementation of peer-to-peer computing? No, Thomas Jefferson called it an "academical village" — the University of Virginia at its birth 174 years ago.

"If you had told me 18 months ago I'd be excited about computers in the humanities, I'd have said you were crazy," said William Wulf, a computer science professor at the university and chairman of the committee whose work led to the creation of the Institute for Advanced Technology, in the Humanities three months ago. "I had the image they were all technophobes."



*An IBM RS/6000 is being used to decipher the relationships between the paintings and poems of 19th-century artist Dante Gabriel Rossetti*

That was before Wulf met history professor Edward Ayers, English professor Jerome McGann and a few others on campus. Ayers, McGann and a handful of scholars at other universities are pushing computers in the humanities far beyond their traditional roles as word processors. According to Wulf, "I think you'll see as dramatic a change in the methods of humanistic scholarship [as a result of computers] as we have seen in scientific scholarship. Just as in the sciences, you're going to be able to ask questions you never even thought of before."

### Textbook of the future?

Ayers is writing a book about the Civil War that contrasts life in two opposing Shenandoah Valley towns — one in Virginia and one in Pennsylvania. But this is no ordinary book; it is a key to a library. In addition to the traditional text, readers — perhaps they should be called "users" — will have access to all the information that Ayers used in his research for the book. That will include 30 years of census data on tens of thousands of residents of the two communities, the military records of 10,000 soldiers, images of local newspapers of the day and detailed three-dimensional county maps.

"You come to a footnote and you click on it," Ayers explained. "Instead of getting the name of the newspaper from which I had drawn a quote, you can see the entire paper. Or you could click on a person and see where he lived on a beautiful color map."

Or, readers might elect to do some pioneering research of their own. A reader could, for example, construct queries such as, "Were poor Southerners more likely than Northerners to desert?"

According to Ayers, the importance of this technology goes far beyond the sheer fun of being able to transcend the fixed, printed word. "The old paradigm was that every thought that's in a book someone else has already had. Here, there's going to be a lot of stuff I didn't pursue. I have no doubt that this will revolutionize the way scholarship is done."

Indeed, the power of computers applied to newly digitized texts is literally turning into one-day undergraduate exercises what previously might have been the basis for a doctoral dissertation.

### Classic applications

For example, classical studies professor James O'Donnell, coordinator of the Center for the Computer Analysis of Texts at the University of Pennsylvania, recently unearthed a 400-year-old translation error in St. Augustine's "Confessions" by electronically scanning all 5 million words written by the fourth-century bishop.

O'Donnell had wondered about a word used in the translation but was surprised when the computer told him it was used solely in the suspect translation. "The likelihood that he used the word exactly once in his life is quite low," O'Donnell said. He has now proposed a better translation, one he said is generally accepted by other scholars.

Professor McGann is using an IBM RISC System/6000 to untangle the complex relationships between the paintings and poems of the 19th-century artist Dante Gabriel Rossetti. Rossetti wrote sonnets interpreting his paintings and painted pictures about the sonnets. He also sketched and copied his pictures, photographed them and sometimes changed the faces of the people in them from one version to the next. In addition, multiple copies and translations of his poems exist, many annotated by his hand and others.

McGann is putting together a "hypermedia research archive," a body of graphic files and texts organized in hypertext fashion. The picture files contain archival and critical information about the paintings and drawings, and the archive is linked to a database containing the 22-volume *Oxford English Dictionary*.

Users of the Rossetti Archive, which is envisioned by its creator as a 15-year project, will be able to select and display for comparison in adjacent windows any combination of color images of paintings, bit-mapped images of original handwritten pages or transcriptions of those pages. Users will also be able to produce their own unique "editions" of Rossetti's works — a collection of sonnets about medieval Italian painters, for example.

The ability to quickly find and compare elements in Rossetti's works will enable insights that would be difficult or impractical to achieve by more conventional means, McGann said. "This ... represents a major innovation not only in textual theory and text management, but ultimately in the whole way the study of literature will be conducted," he said.

## Not your ordinary software

"Issues in the humanities are more subtle and more complex than they are in the sciences, and the amount of material you need to do anything worthwhile is much larger," said William Wulf, a computer science professor at the University of Virginia.

"Computers are just getting powerful enough to deal with these issues."

Indeed, technology is just reaching the critical mass needed to give a quantum boost to the productivity of humanist scholars.

One key to making the dreams of the technohumanists come true is Standard Generalized Markup Language (SGML), a scheme for "marking up" information by "tagging" it to define its purpose. Without SGML tags, ordinary word search software cannot distinguish "baker" the profession from "Baker" the author, for example.

More and more text databases are being offered with SGML tags, relieving users of the tedious task of marking up their documents.

Later this year, WordPerfect Corp. will introduce a conversion program that will convert text files into SGML format in accordance with industry-standard or user-defined rules.

Along with SGML, electronic networks containing on-line catalogs and databases, multimedia functions, relatively cheap mass storage for graphics and images and powerful workstations are redefining centuries-old research methods.

*— Gary H. Anthes*

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# Starting over

**I interviewed IBM's outgoing chief executive officer twice following his ascension to the top office, and each time John Akers offered up a clear vision of what IBM needed to do to prosper. Either he didn't follow his own advice or his instructions were not carried out. Nonetheless, it was good advice. Maybe someone else can put it to use. Here's a sample:**

"For 75 years, certainly for the past 25, IBM has had a remarkable performance in business success. That success tends to have a management team not wanting to tamper with what's in place. What had to happen for this enterprise is to have reality come in and hit us on the head. Reality has hit us on the head."

"I think the cold, hard light of day is upon us; we understand what we have to do, and we're working hard at it."

"The top management in American industry is constantly asking whether or not they're getting their return on investment in information systems. [The IS manager] has to help answer the question, and we have to help as well."

"The vast majority of organizational and management changes are in place today [January 1989]. You don't reorganizationally change a business as large as this one, as much as we have, without creating some disruption. There's been a feeling on the part of IBM people that we're on the right track — and then schizophrenia about more change vs. 'let's absorb what's already in place.'"

"What IBM needed to do better was to be closer and more in concert with our customers. We needed to have a better product line and we needed to be more efficient."

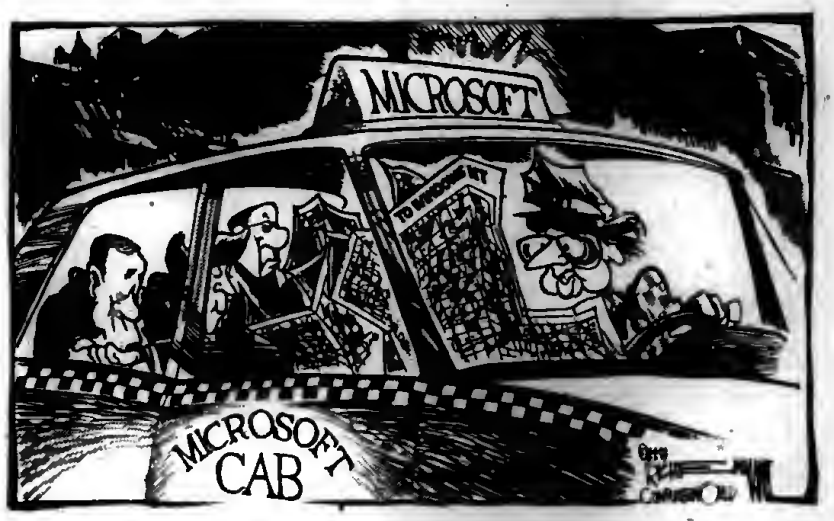
"We don't force anybody to do anything. We try very hard and sometimes better than others to develop products to make our customers the most satisfied of any customers."

The job "has been much more challenging than I ever would have thought."

"I have taken every job that IBM has been nice enough to give me, with a little fear and trepidation. I've tried to learn it and run as fast as I can so that I at least stay even with the challenges. And when I've gotten to the point where I think I know what I'm doing, I usually am asked if I'd like another job... and the thing starts all over again."

Bill Laberis

Bill Laberis, *Editor in chief*




## What's the count?

In his Virus Watch column "Viruses ringing in the new year" [CW, Dec. 28, 1992/Jan. 4, 1993], James Daly stated the "unofficial DOS virus count is approximately 1,500." Something seems wrong. Virus expert John McAfee claimed "over 1,200 viruses" existed in spring 1992 and stated they grow by an average of 20 each week. This means we should have at least 2,200 viruses right now, not 1,500.

The press sometimes claims new viruses appear at an average of six each day. By those estimates, we should have about 4,500 distinct DOS viruses, not 1,500.

And we all remember the 5 million computers scheduled to die on March 6, 1992, at the hands of the Michelangelo virus. I cried when I imagined how one of every 16 PCs worldwide would suddenly go belly-up. But in the end they didn't, and I don't know why.

I wonder if inflated statistics had anything to do with it?

*Rob Rosenberger*
*O'Fallon, Ill.*

## Fan of OS/2

After reading the column by Paul Gillin "Easy as 1-OS/2-3" [CW, Jan. 11], I felt compelled to respond. I have long seen this type of writing in multiple publications describing negative experiences that, from my own personal experience with 2.x, are hard to believe.

I have been running OS/2 Version 2.x since IBM started the early beta-test programs two years ago. My experiences have been 90% positive.

The OS has been very solid for me in multiple environments.

There are many apps, tools and utilities available and coming. Every user I know of who has given 2.x a fair shot has happily dumped that other intel graphical user interface in favor of OS/2. I no longer fight with DOS to squeeze out an extra kilobit or two of memory. With no effort, I have DOS sessions with 633K of available memory.

You have not lived until you have a 9.6K bit/sec. upload, a CPU-intensive task such as archiving with compression to a floppy, 32-bit application compile and a session with F15 Strike Eagle III running at the same time... flawlessly.

*H. V. Belton*
*Plano, Texas*

## No more tears

**Thank goodness for John Chisholm's courage in standing up to the crybabies of the software industry ["Stop whining and leave Microsoft alone," CW, Jan. 18].**

**I for one am sick to death of the half-baked excuses for software being peddled by vendors that spend too much money on lawyers and too little money building usable software. If we believed the likes of some vendors, there would be software nirvana if Microsoft were out of the picture. Maybe the crybabies should take the lead from Microsoft and produce quality software that fulfills real-world business needs. Until they do, I think I'll just stick with Mr. Gates and company.**

*Keith Stillinger*
*Atlanta*

## Multimedia: A successful trainer

What Paul Gillin failed to mention in his commentary "Don't be fooled by hype of multimedia [CW, Dec. 28, 1992/Jan. 4, 1993], is that the No. 1 use for multimedia systems today is computer-based training.

This is not pie-in-the-sky technology. Computer-based training is here, and more and more information systems managers are taking a serious look at it.

As IS managers are learning, the benefits are clearly measurable. Instead of bringing users in training centers, IS can bring training to the users. Moreover, content is always consistent. Users can also explore lessons individually, select topics related to job-specific functions and even measure their level of comprehension.

Gillin is wrongheaded in say that "multimedia is a marketing concept designed to extract big money from you for little benefit." Practical applications are available for those willing to look for them. And those applications are winning over the hearts, minds and budgets of IS managers.

*Mike Seither*
*San Francisco*

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# Working with VANs: No easy passage

Cynthia L. Smith

Very little having to do with technology is as easy as advertised, and that is particularly true when it comes to electronic data interchange (EDI) and value-added network (VAN) providers.

EDI has become a buzzword. We continually see articles describing successes achieved with it, but we don't always hear about the struggles implementation can involve. To the layman, EDI sounds as simple as connecting to a VAN; but in reality, the road to EDI can be a long one, with quite a few rough spots. In fact, quite a few of those rough spots have to do with the VAN providers.

My company has worked with a variety of VANs, and our experience has been mixed. Contrary to what one might assume, the larger VAN providers usually give us the most trouble and seem to have less technical expertise. If you don't get hold of the right person, you are often out of luck. Customer service people are usually available but often aren't fully trained or really able to help.

One project in which we used a large VAN should have taken weeks but took months. As we tested the link, we began to encounter strange problems such as corrupted files and missing test files. The VAN provider was less than helpful in troubleshooting these problems, which meant our technical department had to spend time tracking down the cause.

Paul D. Anderson

The root of the problem turned out to be the type of link used. Although we had never been told this, it turned out that we were on an experimental-type X.25 link, which was not direct, did not work correctly and was unfamiliar to the VAN personnel. Once we found this out, we requested a more common and reliable type of connection.

We've also experienced problems with the interconnects between two large VANs. The VAN providers were not willing to follow up on their interconnects, so it was necessary for us and our trading partner to follow up on every transmission with both VANs to make sure the data actually made it through. This sort of checking can be quite time-consuming because VANs seem to have some difficulty tracking message traffic. A message transmission confirmed one day can disappear from the records the next.

No one expects these projects to be problem-free, but we expected more help. We were lucky to have a patient, helpful trading partner — one that was acquainted with the problems that can crop up and already inclined to give its less-than-helpful VAN provider the boot.

Although in both of the instances described (and many others) we have been able to establish successful, ongoing EDI connections, the process is frequently frustrating and prolonged — a far cry from the popular image. In fact, I know of one very large corporation that has geared up for EDI connection twice in the past five years and then backed off both times because of the difficulty involved.

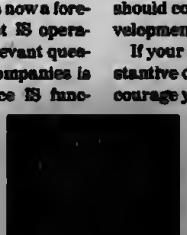
I believe in the value of EDI, but I don't believe there is any benefit to disguising the facts. The reality is that implementing EDI can be challenging, and many VAN providers don't give the service they should. Keep that in mind the next time you read one of those glowing "success stories."

Smith is vice president of IS at Dannas Corp., a worldwide transportation company. She is based in Bellevue, Wash.

# Tiptoeing through the outsourcing minefield

MIS PERCEPTIONS *by* Max D. Hopper

Outsourcing of some kind is now a foregone conclusion for most IS operations. These days, the relevant question for the majority of companies is not whether to outsource IS functions, but how much to outsource and to whom.



Unfortunately, many regard these as simple matters, mere "details," when in fact those details can really land a company in hot water.

Probably the biggest danger lies in the siren song of turnkey solutions.

Today, some companies are tempted by the ultimate extension of outsourcing — the "relax and leave it all to us" option. Allowing outsiders to handle the tactical implementation of your information technology needs is one thing, but permitting them to define what those needs are is quite another. Most, if not all, major companies' interests would be best served by retaining this strategic role. To farm this out is to risk "buying the farm."

At a minimum, a company should retain the functional equivalent of a CIO, who can direct vendor activities from an informed insider's perspective. Also, unless world-class solutions exist in the marketplace, the organization should consider retaining key application development responsibilities.

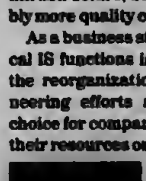
If your company is leaning toward any substantive outsourcing relationship, I would encourage you to assure yourself of the vendor's credentials in several areas:

- Recognized leadership in technology. The fact is that outsourcers often achieve their margins by lagging behind the technology curve.
- A client base and scope of operations that offer true economies of scale. It's a mistake to think that such economies are the natural outgrowth of all outsourcing arrangements.
- A thorough grasp of your business processes and proven expertise in your industry. The woods are full of generalists who know the buzzwords and not a lot more.
- State-of-the-art applications that promise to anticipate the evolving needs of your business. Otherwise, outsourcing is nothing more than a holding action.
- Willingness to provide you with the right of exit. The only way to have a win/win partnering situation is to have an arrangement that fosters an attitude of trust. You must have the ability to exit gracefully if the partnership does not work out as anticipated.

If no one vendor meets all these criteria — or even if one does, but you prefer to retain more functions yourself or to pick and choose "best of class" providers — another option would be to contract the company's IS needs cafeteria-style.

Choosing to employ the most qualified vendors in various functional areas, such as internal systems, commodity processing services such as billing and communications network services, is obviously a more complex route. It requires more management capabilities and probably dictates that you retain more of an infrastructure, but it also provides considerably more quality control.

As a business strategy, vending out noncritical IS functions is very much in tune with all the reorganization, downsizing and re-engineering efforts afoot today and a natural choice for companies that want to concentrate their resources on their real business.



Just be careful not to hand off more than makes sense or to underestimate the disruption that outsourcing can cause to your operations. These are not choices that can be made lightly.

Hopper is senior vice president of information systems at AMR Corp.

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Most IT professionals tell me they would prefer to work with a strong network integrator rather than buying from many independent product suppliers. And yet, they buy bridges, routers, adapter cards, smart hubs and network management, etc., from dozens of suppliers. Why? Because they equate picking an integrator with having to settle for second rate technology. The only way out is to buy networks in pieces and shoulder the nasty job of integration alone. Time-out! At Ungermann-Bass, we don't think choosing between the "Best of Breed" and "One Stop Shopping" is a choice you should have to make. That's why we're the first networking company to combine leading edge products with leading edge integration. At Ungermann-Bass, network integration is just as important as technology. Now you can have the "Best of Breed" from a single source. If your company would benefit from a business partner who is as obsessed with the performance of your network as it is with product innovation, call Ungermann-Bass at 1-800-777-4LAN.

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Charles Babcock

# Mac pushed by Windows

Sometimes when I look at reams of data, an unanticipated image emerges, a snapshot in which the future is revealed. Such an image pops out of the latest survey by the Microcomputer Managers Association, and it bodes ill for the Apple Macintosh in corporate environments.

Invading the business stronghold remains a cherished goal of the marketing battalions at Apple. If client/server applications are needed in the business world, then Apple is ready to produce a server to work with Macintoshes, according to James Groff at Apple's Enterprise Systems Division. But such a server is likely to get a cool reception from its intended audience if our snapshot is correct.

It isn't that the Microcomputer Managers Association doesn't value the Macintosh interface. In fact, the majority of the 402 members who participated in the survey indicated that they believe it produces the highest user satisfaction of any GUI available. But micro managers may not have the luxury of opting for the most ardently supported interface. Only 40% said they expected the Macintosh to be a supported system at their sites 12 months from now, although 48% currently support it.

This is a 17% drop-off in Apple's favorite targeted market. If the Macintosh loses ground at this rate for six or seven years, its corporate presence will shrink to the point where it is supported only as a niche system for design, graphic arts and specialized desktop publishing.

Is it valid to draw such pessimistic conclusions from a single survey? I'd say so.

The average respondent to the Microcomputer Managers survey manages 685 PCs, and hence the attitudes of this group have the potential to reach deep into the corporation. Their responses show an escalating acceptance of Microsoft's Windows as they move beyond the version noted for its crashes. Since Version 3.1 began to supplant 3.0, acceptance has gone up at a rate that represents a tripling of sites.

This is not to say Windows 3.1 is the equal of the Macintosh interface. It may only do 80% of what a Macintosh can do, but that is probably enough to convince managers that it doesn't make sense to buy a Macintosh purely for the interface when something standard is so similar.

IS managers, sensing the expense of supporting a variety of GUIs, are beginning to impose a more rigid hegemony over what they will support.

"I put a PC running Windows 3.1 out among my Macintosh users and told them to find something on it that they couldn't do. I had no takers," the vice president of a San Francisco bank noted at the recent Windows/OS/2 Conference in San Jose, Calif.

In most instances, such a challenge would trigger the reaction one used to expect from taking a stroll down Snipers Alley in Sarajevo. The bank IS manager had a point, however.

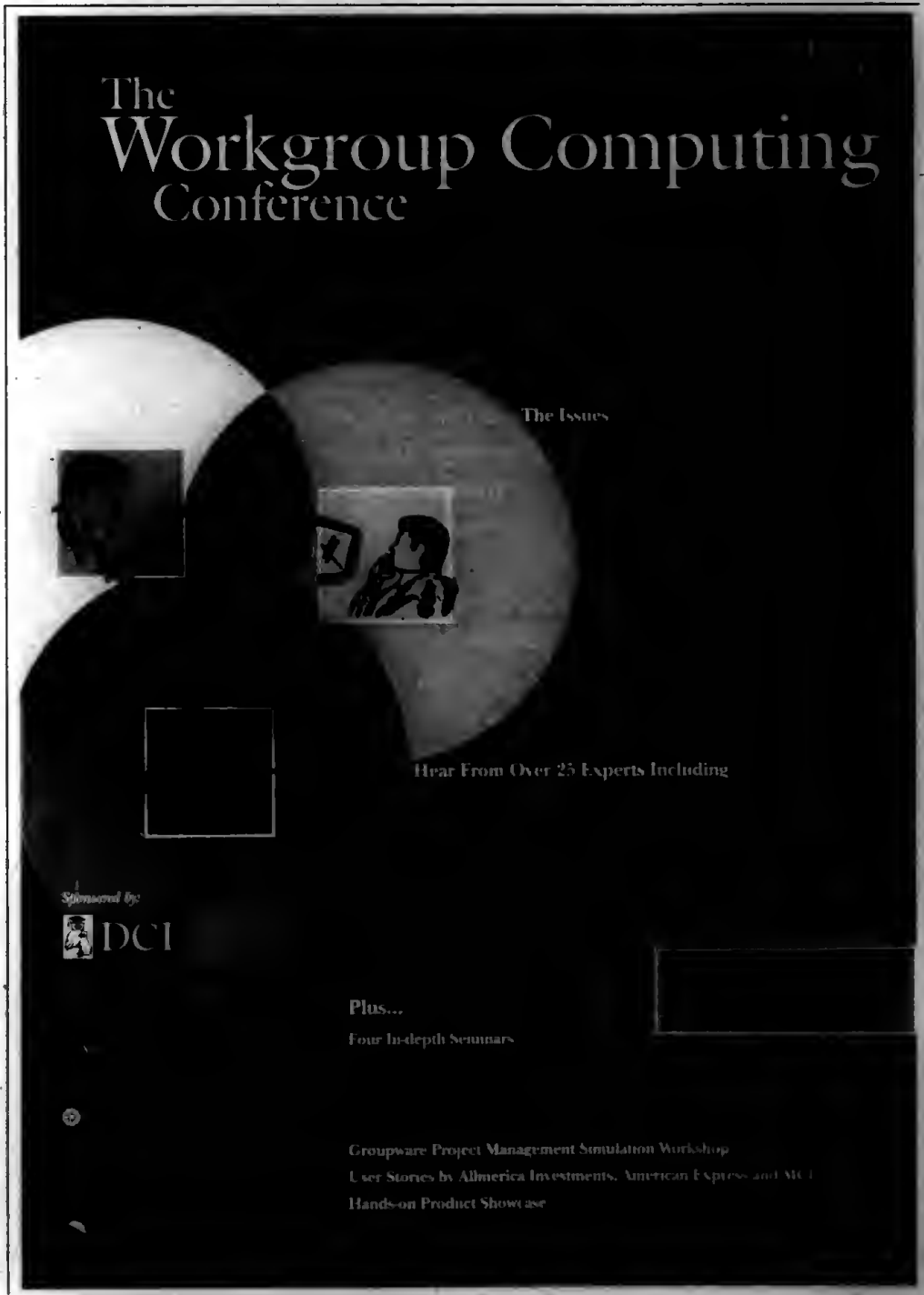
The expense of moving MS-DOS users to a GUI is greater than most users imagine, and the cost of moving to multiple GUIs multiplies that expense. There are hidden training costs to bringing users up quickly on an application and hidden support costs to keeping them expanding their repertoire. The study pegged these expenses at $3,286 per user.

If microcomputer managers have a choice of satisfying most user needs with Windows, leaving isolated pockets of Macintosh users largely supporting themselves, how many new Macintoshes do you think they will endorse purchasing?

If an opportunity for spreading standard Intel-based PCs more widely through the company beckons, how long will PC managers or IS try to resist?

This is the threat that the improved Windows interface poses to the Macintosh, and it will start showing up soon.

Babcock is *Computerworld*'s technical editor.

SONY

Reservation systems

## Travel agency looks to future system freedom

By Michael Fitzgerald
STAMFORD, CONN

Being an information systems director at a travel agency is no day at the beach. In fact, it can occasionally look like jail, particularly at some of the many agencies that continue to get hardware and software for a single reservation system, such as AMR Corp.'s Sabre.

This is the case at McGregor Travel, Inc., a Top 50 travel agency. A longtime user of Sabre, McGregor has always had to accept hardware and software offerings directly from AMR, the parent company of American Airlines. Within the last year, though, the computerized reservation systems (CRS) were forced to allow agencies to buy data-line access without a commitment for hardware, and five-year contracts were reduced to three-year terms.

McGregor's contract with Sabre is entering its third year now, and the company is looking forward to upgrading from its current system to a more powerful one this year.

"We need to go to higher technology this year; we're constrained by what American provides us with," said Christine Sikes, director of MIS/accounting at the $50 million agency. For instance, she said, Sabre only last month said it would support memory management, which exists in versions of DOS after 3.0.

### Myriad choices

McGregor now has several options: renegotiate with Sabre, accept only some pieces of the Sabre offerings (McGregor would probably buy its own hardware, for instance, instead of leasing from Sabre) or switch to a new carrier. The rival Apollo system, for instance, has offered Microsoft Corp. Windows support for two years, while Sabre said it will begin offering that support later this year.

Right now, McGregor uses a Sabre-supplied canned system based on a Data General Corp. MV 7800XP running AOS/VS.

The front ends are 25-MHz 386 PCs from AT&T, which was AMR's main PC provider until the airline switched to Grid Systems Corp. and other vendors last year. McGregor's 38 offices connect to the back-end system via a Sabre switching center in Tulsa, Okla. American has proposed moving the back-end system off the DG minicomputer and onto an Aviion workstation running Unix.

One of the benefits Sikes said she hopes to gain is greater functionality, sometimes through third-party applications. For instance, with Automated Travel Systems, Inc. in Katonah, N.Y., McGregor has designed Fact, a rate polling program to take advantage of certain airline pricing practices.

"Airlines will drop [low] fares into the market at 3 a.m. and weird hours like that and then pull them out 20 minutes later, so this program will grab the fare and book

Travel, *page 38*

**McGregor's Christine Sikes:** *'We need to go to higher technology this year; we're constrained by what American provides us with'*

Paul Gillin

## Borland's crunch time

Philippe Kahn has called 1993 "a make or break" year for his company, and he's running Borland like he means it.

This week, Borland will kick off a limited-time promotion of its newly released Paradox for Windows database that will slash the price of the $795 product to $139. Borland will also affix a $99 price tag on Quattro Pro for Windows for the next three months. Borland calls the offers "promotional pricing." I call it a good, old-fashioned price war. In either case, it's the buyer who wins.

Kahn professes not to be worried about

Gillin, *page 38*

## Docile drive market heating up

By Michael Fitzgerald

The almost nonexistent market for 1.8-in. hard drives is suddenly generating a lot of activity, with two companies making significant announcements recently.

Maxtor Corp., a large San Jose, Calif., maker of hard drives, entered territory once solely occupied by start-ups MiniStor Peripherals, Inc. and Integral Peripherals, Inc. by announcing the highest capacity 1.8-in drive: the 105M-byte MXL-105-III. Maxtor and the IBM PC Co. have publicly talked about IBM using the drives in environmentally conscious PCs due out later this year.

MiniStor, emphasizing the need for ruggedness in what it believes will be a highly portable market, announced two new drives, dubbed the MiniPort 42 and MiniPort 85 after their capacities, that can withstand twice the pressure of anything else on the market. Officials also said it will have "at least" a 130M-byte drive on the market in the second half of the year.

All of this is occurring in a market that will make up perhaps 400,000 of the 30 million hard drives sold in 1993, according to projections by Computer Intelligence/Infocorp, a research firm in Santa Clara, Calif.

"They'll still be fairly exotic by the end of the year," said Kathryn Hilton, program director at CI/Infocorp. Hilton said that as vendors such as Apple Computer, Inc. scale down their expectations for products like the Newton personal digital assistant, the likelihood that subnotebook products will sell in quantity diminishes. These products were expected to have the greatest need for 1.8-in. drives.

MiniStor, however, said other markets will fill the place of subnotebooks. It said it generated 25% of its sales last year from noncomputer systems. Hilton said she did not see this as a big market because of the price of the drives. "Why buy a $300 part for a machine that might cost $500?" she asked.

At the same time, she said the market should produce a 120% annual growth rate during the next several years, hitting 1.7 million units in 1995.

Maxtor's new drive uses the Personal Computer Memory Card International Association (PCMCIA) interface, while MiniStor's comes in both PCMCIA and integrated drive electronics versions. Both firms adhere to PCMCIA Type III.

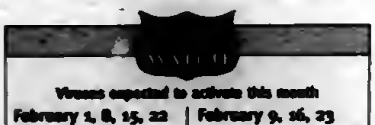
"With PCMCIA, it ushers in a new generation of systems where you don't need an embedded hard drive," said Crawford Del Prete, an analyst at International Data Corp. in Framingham, Mass. Del Prete said the market for these sorts of portable drives may take off. He said that while companies such as Epson America, Inc. have attempted to push the removable hard drive concept in the notebook arena, "with the Epson approach, there's only one thing you can put in that slot. [With PCMCIA], you can put anything you want to put in that slot."

# Viruses wave ebbs in February

By James Daly

The chill winds of February slow down a lot of things: how fast you get out of bed in the morning, how quickly your old Chevy turns over, your enthusiasm for late-night walks. Fortunately, they seem to have also temporarily diminished the number of destructive viruses set to go off this month.

But do not let that lull you into complacency.



**Viruses expected to activate this month**

| | |
|---|---|
| **February 1, 8, 15, 22**<br>Garfield, Exterminator, Bad Guy, Bad Guy 2 | **February 9, 16, 23**<br>Ah, Kamasya, Demon, Demon B |
| **February 2**<br>Ah, Kamasya, Demon, Demon B, Flip, Nuke, Marauder | **February 10, 20, 28**<br>Day 10 |
| **February 3, 10, 17, 24**<br>Victor | **February 12, 19, 26**<br>Frere Jacques, Smack, Payday |
| **February 5**<br>Frere Jacques, Smack, Payday, Frog's Alley | **February 13**<br>Monxla |
| **February 6, 13, 20, 27**<br>Finger, Phenome, Migram | **February 18**<br>Form 18 |
| **February 7, 14, 21, 28**<br>Sunday, Sunday 2 | **February 19, 26**<br>Skism, Skism-1 |
| **February 8**<br>Taiwan | **February 23, 24, 25**<br>Why Windows |
| | **February 26**<br>Sub-Zero B |

Source: FDS Virus Watch — CW Chart: Michael Siggins

There will still be plenty of nuisance viruses around, according to the folks at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software.

The first of February's two sets of rogue code bent on hardcore destruction of data is set to launch tomorrow, Feb. 2. Its name is Marauder. It is a nonresident, direct-action infector of .COM programs, including COMMAND.COM. When an infected program is executed on this date, the virus will overwrite all files in the current directory. Marauder is an encrypted virus, so no text strings are visible within the viral code.

Another annoying set of rogue code is the Why Windows virus, which is a strain of the Swedish Boys group of viruses. It is a nonresident, direct-action infector of .COM programs, including COMMAND.COM, and it will infect one .COM program located in the current directory each time an infected program is executed.

The Why Windows virus attempts to delete the file WINDOWSWIN.COM on Feb. 23, 24 and 25. On Feb. 23 it will attempt to delete C:AUTOEXEC.BAT. On Feb. 24, it will attempt to delete C:CONFIG.SYS, and on Feb. 25, it will attempt to overwrite the C drive root directory and file allocation tables.

As with all viruses, their activation dates are for general awareness and are not exclusive. Many a skilled programmer can do a little tinkering under the hood to change a few lines of code and make the virus go off whenever he desires. You know the rules: Scan any new disk before it is used and backup, backup, backup.

# Gillin

CONTINUED FROM PAGE 35

Microsoft's remarkable success with the $99 promotional pricing of its Access database, but that has to be scaring Borland. Microsoft has sold between 500,000 and 750,000 Access licenses during the product's first two months on the market. That's nearly as much revenue as the entire PC DBMS industry brought in during the third quarter of 1992, according to Software Publishers Association figures.

Borland can't afford to lose its leading market share in PC database management. Kahn says he wants 50% unit share in Windows databases and 35% in Windows spreadsheets by the end of 1993, and my guess is that he'll fight a protracted price war to get it.

### Ready for battle

All this should be great news for users. Borland makes excellent products, and its pricing keeps the rest of the market honest. Borland's year-end layoffs and restructuring were done in preparation for the fierce margin-slicing campaign it is now launching. It's slashing overhead, eliminating middle management and cutting organizational redundancy. Kahn says he won't pay any attention to the stock price, which has plummeted 75% from its 1992 high, for another six months. He and his managers appear to be focusing on what Borland needs to do: Get lean and dig in for a long battle.

Borland will also open a quieter but perhaps equally important front in its campaign for the hearts and minds of IS management on Feb. 19. That's when it will describe in detail its Integrated Database Application Programming Interface (IDAPI) architecture.

IDAPI promises to smooth over the bumpy process of accessing multiple DBMSs from a single view by providing consistent access to PC- and server-based databases through one common set of program calls. Borland's most impressive claim about IDAPI is that it will be able to unite relational and navigational databases in a single view.

Borland has signed up heavyweights such as Oracle, Novell, Computer Associates and IBM to support IDAPI, which is no small accomplishment because most of those vendors have their own data access schemes. But it still has a lot of work to do to prove that IDAPI isn't just another markitecture.

Beta-test versions of the software development kit won't ship until late spring at the earliest, and the acid test will be whether developers start integrating IDAPI into their products by early next year.

Borland's hole card is that it has a huge base of third-party Paradox and dBase database developers who would just love to have an enterprise data access scheme from a vendor they already know. But it's also launching IDAPI into a market that's stuffed with data access options.

Here's hoping it succeeds. Borland makes good products and sells them at competitive prices. It's iconoclastic, and it isn't afraid to break the rules. A healthy Borland is good for the industry. Buyers need someone who can keep the competition on its toes.

Gillin is *Computerworld*'s executive editor.

David Coursey

# Multimedia obsession

There are mornings when I look into my PC monitor and could swear I see the devil looking back at me. Sometimes I am quite certain that Leisure Suit Larry and his successors, the electronic denizens of zillions of mindless computer games, are leading us toward the end of civilization.

It is a world where reading and thinking no longer matter, where symbols are everything and instant gratification is not fast enough. Where users — in the substance abuse meaning of the term — sit passively in front of their screens bathed in the flood of entertainment. Where people interact so much with the electronic world they have little energy left for the real one.

Usually, when these ideas occur to me, I'll wake up in a cold sweat, kick the cat off the bed, roll over and fall back to sleep. But what if this isn't just a bad dream? Maybe multimedia really will finish the job television and video games have already started. Will children have any attention span left once the collective might of the computer and entertainment industries is done with them?

Yes, I know I sound like a Luddite. And whenever I do this, people send letters and electronic messages accusing me of being a flat-earther, destined for the landfill of history. Perhaps, but if you think television has been a wonderfully positive force in society, just wait until multimedia really gets going.

Sure there will be worthwhile multimedia titles, just as *Sesame Street* and *60 Minutes* are worthwhile television programs. There will be multimedia reference works and information sources, perhaps equivalent to CNN or the Weather Channel. Yet I wonder what multimedia will be remembered for.

My guess is it will be for arming the folks who bring us garbage in prime time with an arsenal of new tricks. And for what purpose? Selling soft drinks, beer, fast food, antiperspirant and six different varieties of aspirin?

This is not a blanket indictment of multimedia. Already, multimedia is providing a valuable service: saving thousands of PC displays from image burn-in through the miracle of talking screen savers that are much more interesting than the applications running behind them. And maybe that is the point: Multimedia is such an addictive mind candy that it can easily block the flow of more worthwhile information.

That's not an issue for some people. Many families are turning off their TVs and controlling their children's access to electronic amusements of all kinds. Some parents, probably those without careers outside the home, actually have time to read to their kids.

But go to a poor neighborhood — or a Third World country — and what you'll see is people glued to their TVs and video games. Their children, instead of learning skills, are simply being entertained.

As computer professionals we should care about how our tools are being used and what effect this has on society. I believe we should be tremendously concerned that the multimedia tools we're creating will be used more to propagandize than to educate and to tranquilize rather than to inspire.

It would not be surprising to see, at some point, a serious proposal for government regulation of multimedia program content in the mass media, much as the Federal Communications Commission used to have programming standards for broadcasters. Perhaps software vendors will be required to develop educational multimedia and distribute it free of charge as a means of offsetting the sins of multimedia entertainment. Might some future president appoint a director of the MEPA, the Media Environmental Protection Agency, to protect us from amusing ourselves into oblivion?

Nearly three decades ago, Edward R. Murrow, the pioneering broadcast journalist, expressed his concern about the future of television. His words may be even more prescient as we stand at the advent of mass-market multimedia: "This instrument can teach, it can illuminate; yes, and it can even inspire. But it can do so only to the extent that humans are determined to use it to those ends. Otherwise it is merely wires and lights in a box."

Coursey is editor of "P.C. Letter," a San Mateo, Calif.-based industry newsletter. His electronic addresses are 568-4460 on MCI Mail, 76771,23 on CompuServe and DCoursey on America Online.

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# Travel agency looks to future system freedom

CONTINUED FROM PAGE 35

the lower fare," Sikes said. "Also, the airlines will drop seat prices on [low-capacity] flights a few hours before flight time, so we can poll those and pick up lower fares for customers as well."

McGregor also uses its front-office systems to perform a variety of services. For instance, Sikes runs Blyth Software, Inc.'s Omnis 7 database on an IBM PC clone from Peak Microsystems, Inc. to generate Datafact, a reporting package McGregor built to consolidate client reservations information. Another facet of Datafact is Execufact, a summary of travel information put together for top executives at client companies.

The main issue for McGregor is the limited services it can provide with its current system. For instance, the agency would like to automatically receive travel requests from customers via fax or electronic mail and send back flight and hotel options via the same method.

A problem here is that "we don't know how it'll work with the Sabre system," Sikes said. Sabre is testing this technology right now.

### Multiple carriers

After all is said and done, Doug Knight, McGregor's vice president of finance, said the company may just buy its own hardware and a Lanyon board from Lanyon PLC and tie in to several CRSs. Lanyon boards allow multiple line access for a system, which would give McGregor access to other carriers' lines.

The advantages of this would have to be weighed against the cost of subscribing to other CRSs and the headaches of not having a single CRS to troubleshoot problems.

Down the road, Knight said he thinks travel agencies will become much more automated, to the point where many transactions will be handled without agents.

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## IBM/Canon alliance spawns notebook

IBM Japan Ltd. and Canon, Inc. have announced a jointly developed notebook PC incorporating IBM Personal System/2 technology and a Canon bubble-jet printer in an integrated unit approximately the same size as IBM's previous notebook models.

The ThinkPad 550BJ, to be released in Japan Feb. 19 and at an undetermined later date in the U.S. and Europe, is the first product of an alliance cemented between IBM and Canon last year to develop notebook computer products.

The bubble-jet printer module, positioned between the keyboard and the 9.½-in. 16-gray-scale monochrome liquid crystal display, is only one-fourth the size of the unit used in Canon's BJ-10 portable bubble-jet printer model. Its reusable ink cartridge can print up to 70 pages between refills.

The 116 char./sec. printer was designed to produce 360 dot/in. quality.

The 550BJ incorporates a 25-MHz 486SLC microprocessor made by IBM under license from Intel Corp.

Prices start at $2,380 for a floppy disk-based model.

*—David Kellar, IDG News Service*

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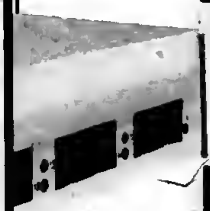

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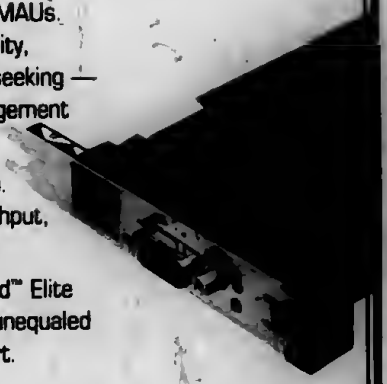

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# HP trade-in push

## Streamlined program targets Apollo users, probes Sun's vulnerabilities

By Maryfran Johnson

Training its sights ever more sharply on the 100,000 stubbornly faithful users of the former Apollo Computer, Inc. workstations, Hewlett-Packard Co. recently fired off its most aggressive upgrade program ever.

The roster of acceptable trade-in gear includes everything, it seems, but toaster ovens and microwaves.

From the old Apollo DN Series to HP/Apollo 9000 Series 300s and 400s, HP's TradeUp '93 offers 15% trade-in credits on Sun Microsystems, Inc. SPARCstations, Silicon Graphics, Inc. workstations, IBM RISC System/6000s or RT workstations, and Digital Equipment Corp. DECstations.

The Palo Alto, Calif.-based vendor, which acquired Apollo in 1989, is also offering deals on its HP 700/RX line of X Window System terminals. Users can trade in 80386- and 1486-based PCs or several other brands of color X terminals for 10% discounts on HP-700/RX stations.

"It's a fairly aggressive trade-up program," said Doug Eltoft, director of operations for the Iowa Computer-Aided Engineering Network at the University of Iowa in Ames, which still uses dozens of Apollo workstations and older HP machines.

Eltoft said he is trading in 10 to 15 HP 400T workstations, which run the Apollo/Domain operating system, for a comparable number of HP 9000 Model 715s running HP/UX Unix.

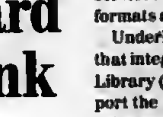
**What a deal!**

**Highlights of HP's Trade-Up '93 program:**

**A 15% trade-in credit toward the purchase of an HP workstation on machines from Sun, DEC, IBM, Silicon Graphics, HP's Apollo division and Apple.**

**A 10% trade-in credit for Intel 80386/1486-based PCs and X Window System terminals.**

**Discounts on expanded RAM and mass storage devices.**



"We amortize our computer equipment over four to five years, and looking at when I bought these systems and the cost of trade-up, HP is right on our depreciation schedule," Eltoft noted. "I didn't have any trouble justifying the purchase."

### Pump up the power

The power boost will be a substantial one, he added, because the 400T rates about 11 SPECmarks of performance while the Model 715 boasts 72 SPECmarks.

At the very least, the program offers a more streamlined, stable alternative to HP's past efforts, which company officials described as "burdensome" and "difficult to communicate."

"We had tables with 15 different levels of credit, depending on what you were trading or buying, and those tables changed every three months," said Pete Dubler, the installed base marketing manager of HP's workstation group. "We also had separate programs for distributors and certified resellers. Now we've combined them all with the objective of one simple, long-term program that's here for all of 1993."

Despite the admitted drawbacks, HP claims to have converted thousands of Apollo/Domain users in 1992. Its archrival, Sun, which has its own trade-up program aimed at Apollo users, likewise claims to have lured thousands of users to its Scalable Processor Architecture (SPARC) platform.

Just last week, Sun announced a new wrinkle in its own upgrade program with a 40% discount for users moving to the $18,000 SPARCstation 10 Model 30. Because the Model 30 will run the Solaris 1 operating system as well as the follow-on Solaris 2, it should also appeal to users unwilling to make the operating system switch just yet.

New operating systems and relicensing software are often causes for "considerable resistance" to trade-up programs, said Lisa Thorell, an analyst at Dataquest, Inc. in San Jose, Calif.

What could weaken that resistance among HP users now is the allure of high-performance hardware — the new workstations offer seven to 10 times the power of the old ones — and an increasing number of features and migration tools built into HP/UX 9.0 specifically for Apollo/Domain users.

Analysts suggested that HP's newly aggressive trade-up program could stimulate market growth in its direct and indirect channels. Another possible benefit for HP would be boosting its visibility in Sun territory.

Dataquest analysts noted that HP leads Sun in workstation price/performance numbers and has built a solid technical track record during the past two years. Sun is also more vulnerable now because of the conversion to Solaris 2 and the SPARCstation 10 line, which has been hobbled somewhat by shipping delays.

For Sun's part, however, analysts said the SPARCstation 10 offers a more flexible upgrade path with scalability to multiprocessor systems. And when it comes to the discounting wars, Sun often out-discounts its rivals.

# DEC heads toward PC LAN/VMS link

By Michael Vizard

Digital Equipment Corp. recently put in place a major piece of its plan to integrate PC local-area network environments with its VMS-based systems.

The move is the result of WordPerfect Corp.'s announcement that its word processing software now supports Version 1.0 of DEC's TeamLinks for Windows groupware.

TeamLinks, which is still undergoing beta testing at DEC customer sites, is a set of software packages designed to foster the integration of PC applications across DEC's Pathworks network operating system. Pathworks is DEC's implementation of LAN Manager from Microsoft Corp.

### Video, mail and conference

The DEC groupware offering consists of TeamRoute, an X.400-based electronic-mail system that can be used to link PCs with host-based office automation systems, including DEC's All-in-1 office automation systems for VMS; VAXnotes conferencing software that supports PC clients; and DEC's VTX videotext applications.

The TeamLinks lineup also includes DECquery, which allows PC users to query and browse SQL-compliant products, such as Oracle, Rdb, RMS, DB2, VSAM or IMS databases, and services that convert data for different document and file formats as users exchange documents across the network.

Underlying these applications is a distributed file cabinet that integrates Windows applications using a Dynamic Link Library (DLL). Suppliers of Windows applications that support the DLL in TeamLinks include WordPerfect, Lotus Development Corp. and Microsoft.

WordPerfect added a module to Version 5.2 of WordPerfect that enables users to access other applications using TeamLinks, said Shaun Stirlind, product manager for WordPerfect for Windows. As a result, users of applications under TeamLinks will be able to click on a WordPerfect document to mail that document to another user. Previously, users had to file that document, leave WordPerfect, open an E-mail application, create a message, access the WordPerfect document and send it as an attachment to the E-mail message.

"We have a long-term investment in Digital products, so TeamLinks gives us a migration plan for integrating PCs with our DEC systems," said Bob Adams, manager of technical services at Ciba Corp., a pharmaceutical firm in Hawthorne, N.Y.

Adams noted that another benefit for Ciba is the reduced cost of purchasing PC software on a per-user basis. Previously, Ciba would purchase a full All-in-1 license of its VAX, but that software used only about 10% of Ciba's VAX processor horsepower. The TeamLinks approach allows him to purchase the exact amount of PC software he needs for Ciba.

Pricing for TeamLinks starts at $99 per user for media, documentation and license, which includes DEC's TeamRoute software. Additional user licenses are priced at $79, and server software pricing starts at $364.

## In Brief

### Novell documentation on-line

Novell, Inc. announced that it has licensed Electronic Book Technologies' DynaText publishing software to produce on-line documentation for Novell's upcoming NetWare 4.0. The technology will let users view, search and print documentation under DOS, Microsoft Corp. Windows, Unix and Apple Computer, Inc. Macintosh platforms, Novell said.

### Mass-market LANs

Microsoft Corp., Proxim, Inc. and AST Research, Inc. are teaming up to offer a prepackaged, wireless local-area network system through the mass-market channel. Aimed at small businesses and companies with mobile offices, the Advantage Net system includes Microsoft's Workgroup for Windows networking software on AST PCs based on Intel Corp.'s 1486 chip. The PCs are linked together using Proxim's Rangel.AN/ISA wireless LAN adapters. Retail pricing is expected to start at about $2,000 per node.

# HELP LINE

## Lotus' CC:Mail

*This is another installment in a series of articles containing questions commonly asked by users and responses from vendors' support lines. This week: Lotus Development Corp.'s CC:Mail electronic-mail package.*

**Q: Sometimes I need to increase performance of CC:Mail Remote for MS-DOS. How do I do this?**
A: Just like the regular CC:Mail post office, the remote database needs maintenance from time to time for optimum performance. Run the remote reclaim process to clean up your remote database.

**Q: Is there any way to automatically save a copy of messages I send?**
A: Yes. You should create a personal folder called "message log." A copy of each message you send will be placed in this folder automatically.

**Q: The "backspace" key and some of the other keys near it (like the "=" key) send different characters to the screen under DOS. Instead of a backspace, I get a foreign-looking character. Why does this happen?**
A: You have OEMANSI.BIN=XLAT850.BIN (or some other XLATx.BIN file) in the keyboard section of SYSTEM.INI. Our install program (and other applications' installation programs) will place this there if you select international character setup. This allows programs to display character sets that are specific to the particular language.

Replace that line with:

OEMANSI.BIN=

Also, if you have a 101-key keyboard, make sure that Type=4 is set in the same section.

Type=3 is for 84- or 86-key keyboards.

**Q: I get the message "Incomplete installation" when trying to access CC:Mail for Windows 1.10 or 1.11. What is the cause?**
A: This means that your SOFTEK.INI or TEMPLATE files (TEMPLATE.BMP, etc.) are not in your Windows directory. This is usually caused by neglecting to perform the workstation part of the software installation. You must run the INSTALL program on the User Install disk from within Windows for each PC that will be running CC:Mail for Windows. There are tips for automating this process discussed in the Windows Installation Technote from our bulletin board service at (415) 691-0401. Or, get this information via CompuServe (GO LOTUSB, Section 11).

**Q: How do I force a page break using CC:Mail for MS-DOS?**
A: Place the CTRL-L (.) character in the body of the text.

**Q: Sometimes faxes I receive through CC:Fax are upside down. How do I read them?**
A: The "upside down" appearance is caused by the sender, who has put the paper in the machine upside down. You can rotate fax images 180 degrees so they appear correctly in CC:Mail. To rotate faxes, do the following (depending on which version of CC:Mail you are using): In CC:Mail for MS-DOS or Windows, simply press the asterisk (*) key. For CC:Mail for Macintosh, just press the fax rotation button in the lower left corner of the CC:Mail window.

**Q: I set the CCMAIL-SMTP-DIR-PATH environment variable, but no SMTP addresses appear in the SMTP directory window when I click the view button. Why does this happen?**
A: The CCMAIL-SMTP-DIR-PATH variable must be set to the full path and file name of the SMTP directory file (by default it is "ccmail-smtp-dir").

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## IS Status Quo

Architectural Crisis
Impact of Gridlock
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Client/Server: Only

## Cooperative-Server: An Enterprise Solution

Distributed Applicotion Develop
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## J.J. Kenny Solves its Architectural Crisis

# OOPERATIV

## AN ENTERPRISE SOLUTION

BY RICHARD A. SKRINDE

*"The information infrastructure in today's typical enterprise is plagued by an 'architectural crisis' — a profusion of vendors and incompatible products. In this complex environment it has become increasingly costly to acquire, use and operate computer systems."*

*— The Gartner Group*

*Today, the Information Systems (IS) organization is indeed facing a crisis. Over the past few decades it has presided over the growth of an ad hoc infrastructure that has increasingly become a liability to the enterprises it serves. Faced with rising costs and increasing demand, IS must somehow turn the liability of this ad hoc distributed information infrastructure into an advantage if it is to survive.*

Adopting a new technology foundation will lead to that advantage. Framingham, Mass.-based market researcher International Data Corporation (IDC) polled more than 1,600 IS departments and found their number one priority is migrating to more modern systems.

Sensing this impending migration, Oracle Corporation responded by developing cooperative-server technology that allows IS to easily deploy, integrate and maintain database applications on an enterprise-wide basis. Users are finding this new technology to be a high-powered answer to their architectural crises.

This new cooperative-server technology comes at a time when enterprises are pervaded by "point solutions" — computer systems with a local focus that fail to address enterprise architectures. "Users in search of solving specific problems have acquired many point solutions that may be ill-suited to IT strategies," notes the Gartner Group, a market research firm in Stamford, Conn. "These solutions create redundant, inconsistent and inaccessible data. Vendors have designed applications that

# E-SERVER

operate within their proprietary environments but fail to interoperate in the users' increasingly multi-vendor IT infrastructure."

Point solutions do provide short-term financial-savings through improved business unit productivity and lower computer system costs for individual applications. Nonetheless, with no technology or methodology to connect the myriad of points, the enterprise faces global information gridlock.

### Impact of Gridlock

IS is spending too much time and money trying to keep this crazy quilt of point systems operational. On top of that, users are demanding more and more IS support. The IS department at J.J. Kenny, the world's leading municipal bond rating and trading firm, exemplifies today's IS architectural problems.

***"I had four separate operations going on and the overhead was killing us. A good portion of our yearly expenses was related to IS. We knew we had to simplify our IT architecture. We also knew that any new IT investment would have to provide both short-term economic savings and a compelling long-term strategic advantage."***

***— Thomas Zielinski, CIO J.J. Kenny***

Chief Information Officer Thomas Zielinski describes his situation this way: "I had four separate operations going on and the overhead was killing us. A good portion of our yearly expenses was related to IS."

And if things aren't bad enough, the Gartner Group warns that IS will face an even bigger challenge in the '90s: "The enterprise's traditional hierarchical structure is flattening in order to reduce overhead and costs while increasing organizational responsiveness and innovation. Pushing decision making down to the work group level implies that the information necessary for proper judgments is available at that level. In this environment, IS will be charged with providing global integration on a massive scale."

How can struggling IS departments make the quantum leap in capabilities required to provide enterprise-wide data access and distribution? And what is the role of vendors? They can no longer rely on pie-in-the-sky architectures or future standards; the architectural crisis is now, and products are needed immediately.

### Search for a Solution

Within its current architectural constraints, IS cannot possibly meet the full range of growing user requirements. Yet IDC research reveals that the search for a technology migration pattern that will modernize the IS infrastructure must be financed by a budget whose growth is tied to the rate of inflation. Given that restriction, eight out of 10 IS executives surveyed by IDC say they are still willing to consider any affordable new technology. Five out of 10 surveyed IS sites have already adopted what they claim to be an open systems architecture.

A recent survey of 671 mainframe sites performed by Computer Intelligence, a market research company based in San Diego, supports the IDC findings. That survey finds that only 39% of planned new applications will run on mainframes. In addition, 40% of existing mainframe applications being rewritten are destined for other platforms.

Zielinski is a user who knows that the time has come for such changes. "We knew we had to simplify our IT architecture," he states. "We also knew that any new IT investment would have to provide both short-term economic savings and a compelling long-term strategic advantage." (Sidebar to follow)

### Client/Server: Only a Partial Solution

Client/server computing implies processing a database application on multiple computers. The client exploits the cost/performance of the workstation to process the user interface and the application logic. This allows the server to concentrate on data-intensive operations. The two sides are connected by a network, allowing any client access to any server.

***"Client/server architecture requires complex application programming to move beyond accessing data on a single server."***

The trade press is filled with tales of successful off-loading, downsizing, and rightsizing projects based on the seemingly divine ability of client/server computing to unify mainframes, midrange systems and PCs. But is client/server computing really a panacea for the '90s?

Proponents claim that client/server computing is the bridge that connects the needs of departmental users wanting ready data access with centralized IS, which wants data control. These proponents further claim that the client/server approach will:

- foster system integration
- allow organizations to respond quickly to business changes
- adapt easily to new technologies
- take advantage of computing

price/performance improvements
• solve the entire IS architectural crisis.

The Gartner Group is more conservative in its evaluation, saying, "Client/server is a good fit with organization restructuring, it exploits the ever-growing power of hardware, and it supports the shift in the use of desktop systems from standalone machines to heterogeneous networks. Client/server implementations have provided short-term economic returns through end-user productivity, reduced training time and expense, and improved customer service."

Despite these advantages, however, client/server computing is still only a point solution. And like any other point solution it can only improve productivity and lower costs for individual systems.

According to Colin White, president of Database Associates and the foremost expert on database technology, "Client/server computing has not fully solved the integration problem, nor has it matured enough to tackle core IS applications that must support upwards of one thousand users. Client/server approaches must provide mainframe-equivalent response time, throughput, availability and reliability. Until the tools for the integration and management of large-scale, mission-critical client/server applications appear, it will be difficult for IS to widely adopt client/server technology."

Research done by IDC and the Gartner Group seems to substantiate White's position. IDC finds that the number of users moving or planning to move to client/server computing shows little growth, while the Gartner Group says only about 5% of the total application portfolio in most large IS shops employs client/server technology.

***"Until the tools for the integration and management of large-scale, mission-critical client/server applications appear, it will be difficult for IS to widely adopt client/server technology."***

***— Colin White, president, Database Associates***

Says IDC: "The disparity between the promise of client/server computing and the reality of technical implementation threatens to slow further technical development and inhibit customer adoption of client/server computing." Concurs the Gartner Group: "An uncertainty still surrounds client/server computing, particularly with respect to potential problems and complexities that neither the vendors nor the trade press address."

## COOPERATIVE-SERVER
AN ENTERPRISE SOLUTION

In order to solve this architectural crisis, the scope of client/server computing must be expanded to include:
- automatic and transparent integration facilities to connect all of the point systems
- streamline application development support for the enterprise's largest mission-critical applications
- open architecture and emerging standards compliant.

With these objectives in mind, Oracle introduced the ORACLE7 cooperative-server, its latest database release. This product, which represents the results of an intensive, 300-man-year development effort, is designed to satisfy both the departmental and central IS communities. Using cooperative-server technology, IS can now easily deploy, integrate and maintain database applications across the enterprise. These capabilities clearly elevate the ORACLE7 cooperative-server above earlier client/server approaches.

Describing the IS status quo prior to cooperative-server technology, the Gartner Group states, "Investment in IT — mainframes, minicomputers, PCs, personnel and services — generally yielded less than the sum of its parts. Synergy among the various components of the IT infrastructure was accomplished through bottlenecked expensive system integration projects, piecemeal approaches, or not at all."

Now, with ORACLE7, any client can access data on one or more servers with full location transparency and site autonomy. This is accomplished by allowing data to be transparently distributed, replicated or processed in parallel.

According to IDC, "Cooperative-server technology provides any site with the intelligence to communicate with servers at all other sites, which minimizes management overhead of communications and opens up data to any place in the enterprise. Location transparency and site autonomy allow a query or update to access any number of servers with the same SQL statement as if the data were on a single server. The cooperative-server also provides a cost-based optimizer to minimize network and system overhead, and a resource limiter to protect against 'runaway' queries.

"Cooperative-server technology allows IS to create an application once. It can then be spread to other locations throughout the enterprise without changes, no matter what the arrangement of the computers or the software."

In order to be a successful architectural solution, a distributed database must extend beyond site autonomy and location transparency to include vendor-network and vendor data store transparency. Oracle achieves vendor network transparency with Version 2.0 of its SQL*Net network connectivity product. SQL*Net provides automatic, multi-protocol interchange capabilities that extend the reach of the cooperative-server across previously incomparible networks. For example, an application running on a TCP/IP network may seek access to data located on a mainframe, a Novell network or any major systems vendor network. In such cases, SQL*Net transparently translates the protocols. This eliminates the need for expensive hardware-based internetwork bridges or protocol routers.

***"Oracle is the foundation of the database industry. With the introduction of its ORACLE7 cooperative-server, Oracle provides a solid footing for a new distributed database architecture for the '90s."***

***— International Data Corp.***

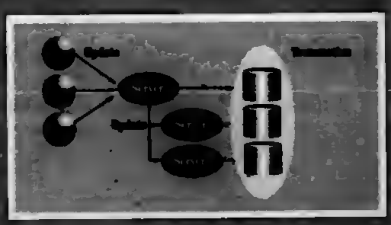
Beyond its multi-protocol interchange capability, SQL*Net 2.0 takes advantage of the redundancy found in most enterprise networks to provide automatic alternative network routing. In this environment, if the primary network is down, SQL*Net attempts to make the connection through an alternative network.

## DISTRIBUTED APPLICATION FLEXIBILITY

Cooperative-server technology uses distributed transactions and three modes of data replication to
- allow distributed application flexibility
- insulate applications from the complexity of managing distributed updates
- keep mission-critical applications up and running despite server crashes or sluggish or failed networks

**Distributed Transactions**

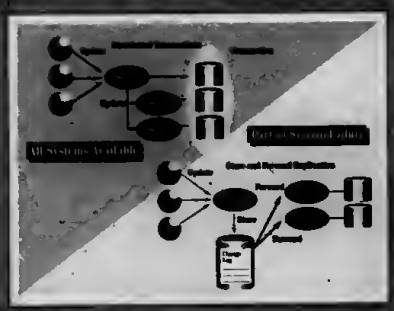
For applications that require multiple sites to [illegible] information, the distributed transaction [illegible] cy of all data at all times. For example, [illegible] to savings requires two update statements. If [illegible] two separate machines, both statements [illegible] ment can update. The cooperative server [illegible] phase commit. The application is assured [illegible] because the same commit statement applies [illegible] one, or many servers.




**Real-Time Replication**

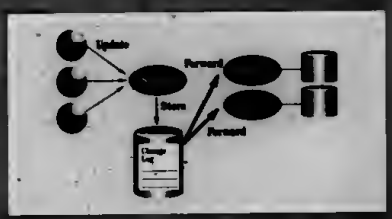
Other applications may need more flexibility than is provided by the distributed transaction mode. They require [illegible] and cannot stop processing in the event of a site failure. [illegible] manufacturer might want to update the shipping [illegible] new order is placed. However, if the shipping system [illegible] facturer cannot stop taking orders. The real-time [illegible] replication to accommodate such situations.

In the event of a site failure, rather than [illegible] automatically engages a store-and-forward mechanism [illegible] destined for the failed site. When the site [illegible] data is automatically forwarded using two-phase [illegible] all sites have received all updates once, and [illegible] of cation is useful for many applications because [illegible] distributed transactions when all sites are up, [illegible] to continue in the case of a site failure.



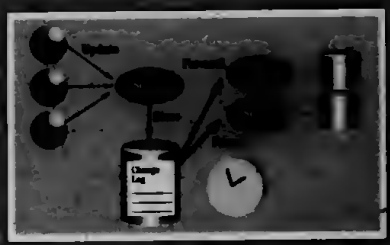

**Store-and-Forward Replication**

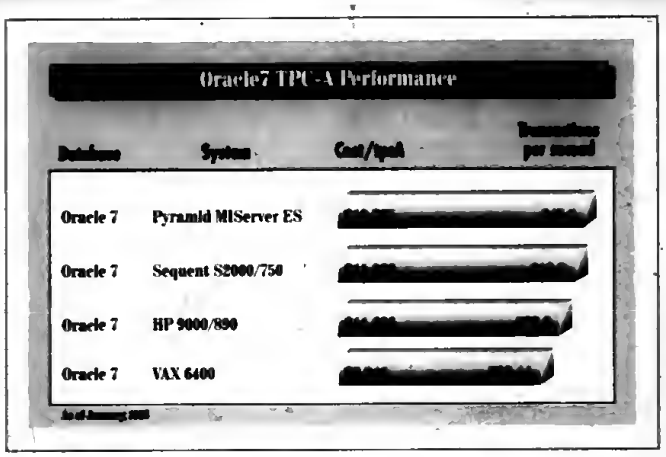
Some applications want their multiple sites [illegible] at intervals. This can also be accomplished [illegible] mode of replication. With store-and-forward, [illegible] sites are recorded locally and forwarded [illegible] updates are range in frequency from [illegible] to dial-up connections for notebook [illegible] commit assures that all sites receive updates [illegible]




**Time-Based Replication**

Just as some applications require [illegible] at intervals, others require [illegible] sites [illegible] schedule. For example, the [illegible] distribute pricing information [illegible] business day. ORACLE7's [illegible] rates this. As a result, network [illegible] increased.






Just as the typical enterprise does not rely on a single network protocol, neither is it married to a single database management system. The Oracle Open Gateway family of products allows IS to transparently reach into all of the enterprise's data stores. Through the Open Gateway, an application SQL statement automatically accesses and combines both relational and non-relational data found in most major data stores.

***"We have systems in place today that we can't live without. And at the same time we have new systems that need to be developed. The cooperative-server allows us to simultaneously access data from both our MVS and our UNIX environments."***

***— John Black***
***systems architecture manager***
***US West, New Vector Group***

The Oracle Programmable Gateway Tool Kit extends this capability to include the data stores of robotic systems controllers, electronic mail or Electronic Data Interchange (EDI). It does this by allowing users to build custom interfaces through remote database procedure calls.

John Black, systems architecture manager at US West, New Vector Group, emphasizes the need for transparency across networks and data stores. "We have systems in place today that we can't live without," he notes. "And at the same time we have new systems that need to be developed. The cooperative-server allows us to simultaneously access data from both our MVS and our UNIX environments."

With ORACLE7, Black is able to isolate his applications from changes to the data stores, servers or networks. This interoperability gives him the ability to leverage the value of both his new and old system architectures.

### Dealing With Centralized Applications

Clearly, the cooperative-server allows IS to unify applications that are distributed across multiple servers, networks and data stores. But what about applications that do not fit well into a distributed architecture and are best left centralized?

Until now, when a host-based or client/server application outgrew the host or server, users had two alternatives. They could either replace the outgrown computer with a larger, more expensive device, or fragment the database among multiple smaller computers. If they chose to replace the computer, they paid more for a larger machine and lost productivity during the transition. Support costs for retraining and other upgrade overhead also increased. If they chose to fragment the database, the database administrator was forced to manage a distributed database architecture.

The cooperative-server allows IS to effectively process large, centralized applications by automatically linking several smaller, less expensive computers together to replace an expensive, large one. This is accomplished through the parallel processing of data. Multiple servers can now transparently share data on a common set of disks. This provides a nearly unlimited scale of performance. It also provides high availability because if one server should fail, the other servers have access to all of the information. Best of all, the Database Administrator (DBA) only has a single database to manage.

### Streamlining Application Development

Enterprise integration is a crucial component in a successful computing architecture, but in order to realize its full value, a great number of new and replacement applications must be rapidly developed. How can this be done at a time when IS budgets are so constrained?

***"ORACLE7 also makes our programming job simpler. It allows us to define the business rules once in the database so we don't have to define them over and over again in our application code. We can respond more quickly to changes in the business."***

***— John Black***
***systems architecture manager***
***US West, New Vector Group***

Removing code from each individual application and centralizing it in the server is critical to solving this problem. The cooperative-server offers ANSI/OSI standard declarative integrity constraints. These constraints eliminate procedural programming when implementing entity and referential integrity business rules such as "inventory quantity must be greater than zero," or "no customer can be deleted while it still owes money." This will reduce at least 25% of the procedure code from a typical server application.

Of course, procedural programming of the server will always be required for organization-specific business rules such as inventory reorder policies or special audit policies. To assure IS success in this effort, modern programming tech-

nologies have been integrated into the server.

PL/SQL, Oracle's procedural extension to industry standard SQL, has incorporated many of the best features found in other advanced programming languages such as C++ or ADA. IS programmers, even those with no prior server programming experience, will quickly gain confidence and productivity due to the richness and ease-of-use of this language.

Enterprise applications are large, requiring a multi-application, multi-developer team approach. ORACLE7 provides modular programming constructs that leverage team programming efforts. The PL/SQL procedure package treats collections of procedures, functions, cursor definitions, constants, variables or exemption definitions as single database objects. It further defines the procedure interface separately from the body. This frees programmer teams to develop and test independently once an interface has been defined.

All 12 ANSI SQL3 trigger types, including "before", "after", "row" and "statement" triggers are supported. They more efficiently support programming tasks such as auditing, initializing global variables, or preventing updates that violate security or integrity constraints.

These features have been proven by users to save time and money. "ORACLE7 makes our programming job simpler," claims Black. "It allows us to define the business rules once in the database so we don't have to define them over and over again in our application code. This makes our application code simpler, makes our programming faster and lets us have more flexible applications so we can respond more quickly to changes in the business."

### Mission-Critical Production Environment

For cooperative-server technology to play a pivotal role in solving the architectural crisis, it must be able to off-load and replace the expensive host-based architectures that are processing the enterprise's largest applications. For this to happen, the cooperative-server must provide mainframe-equivalent availability, reliability and performance. And today's DBA must be able to support these applications.

ORACLE7 is a proven production environment for mission-critical applications, as it is built upon the same engine as the widely accepted Oracle Version 6 database. A recent survey of Oracle customers substantiates this claim. In addition, ORACLE7 TPC-A performance benchmarks prove it to be a match for the mainframe. (Chart opposite)

### Administrative Tools

A new generation of administrative tools is required to simplify the management of cooperative-server computing. The cooperative-server provides a first tier of tools with its distributed administration system. A menu-driven point-and-shoot DBA interface and high-availability utilities such as on-line backup and recovery help to simplify administration of

## J. J. Kenny Solves its Architectural Crisis

J.J. Kenny, the nation's largest municipal bond information and brokerage organization, solved its IS architectural crisis with ORACLE7 cooperative-server technology. At Kenny, the database system is not just an adjunct to its business. Given the database-intensive nature of rating, tracking and trading, the database is at the core of the company.

Prior to implementing ORACLE7, Kenny's IS infrastructure was typical of the traditional, heterogeneous, conglomeration found in today's larger IS organizations. An IBM mainframe running DB2 was surrounded by Digital Equipment VAXs running the Oracle database, Hewlett-Packard processors running the Image database and Concurrent Systems running a homegrown database.

Chief Information Officer Thomas Zielinski believed that migrating to the cooperative-server platform would provide a considerable short-term cost savings and long-term competitive advantage because it would allow his firm to offer better on-line products and services. Zielinski's wish list was not inconsiderable. He wanted to:

- centralize operations
- improve database performance
- fit into the existing satellite delivery system
- allow for incremental growth in processing power and [illegible] development.

His new technology [illegible] approved in 1990 and [illegible] track to have the first [illegible] tems out of test and into [illegible] before the end of 1992. Most [illegible] old systems are being replaced

mission-critical applications.

Security management has been simplified through the ORACLE7 cooperative-server role-based security capability, wherein security is assigned by job type rather than by individual. This implementation has been accepted by the ANSI/ISO SQL standards committee as the basis for future security standards.

### Open Systems Approach

The architectural crisis requires a multitude of products to operate in the enterprise environment. Therefore it is very important to have standards. To meet this need, openness has been built into all aspects of the cooperative-server. ORACLE7 is 100%-compliant with the ANSI/ISO 1989 SQL standard and includes support of its enhanced integrity section with declarative referential integrity. ORACLE7 has also passed the U.S. Federal Government's SQL compliance test. Its triggers are designed to meet future ANSI/ISO SQL standards.

Transaction processing monitors are becoming an important IS tool. With this in mind, ORACLE7 is designed to comply with the X/Open, XA standard. Its role-based security supports external RACF and ACF2 in the mainframe environment, as well as the UNIX and Novell group function. It also supports emerging network authentication services as outlined in the Open Software Foundation's Distributed Computing Environment (DCE). Its global naming function is designed to support the DCE X.500 directory services standards.

### Cooperative-Server's Role in Solving The Architectural Crisis

IDC believes that the cooperative-server takes a big step towards solving the architectural dilemma. It states, "Oracle is the foundation of the database industry. With the introduction of its ORACLE7 cooperative-server, Oracle provides a solid footing for a new distributed database architecture for the '90s. Due to the industry-wide support of Oracle, IS can be assured of finding sources from third-party suppliers of the tools and applications that will make ORACLE7 the complete solution that IS requires."

The time is now for migrating to a new architecture. By adopting ORACLE7 cooperative-server technology, IS can gain maximum productivity from its existing IT investment and begin resolving its architectural crisis.

Zielinski puts it this way: "The Kenny database is our most valuable corporate resource, with all of our business dependent upon its performance and viability. Our new ORACLE7 architecture positions us for growth in the '90s and will allow us to produce new products more quickly than ever before. All of this will be done in a more efficient and economical manner than with our traditional host-based environments."

What is the database future in your IS shop? A lot of tough questions must be answered. For starters, what are the actual costs and benefits of adopting cooperative-server? And what will it take for upper management to buy into supporting cooperative-server technology?

Oracle understands the difficulty of resolving these questions and has developed a program to help you determine how the cooperative-server can best work for your organization.

The CB-90 (Cost Benefit Justification Process for the '90s) is a program created to help users make more cost-effective technology decisions by identifying the real business value of alternative investments. It is based upon the Information Economics model which has been in worldwide use for several years.

Oracle has adapted this methodology to key issues facing IS. These issues include rightsizing, business process reengineering and the following match-ups: networks versus mainframes, and host-based systems versus client/server and cooperative-server systems.•

*Richard A. Skrinde is a leading DBMS authority and strategic planner specializing in the role that emerging technologies play in improving enterprise information systems.*

Call 1
CB-90

# Utility warming to client/server

## Gas-modeling software improves customer response time, job precision

By Lynda Radosevich
NEIGHBORVILLE, ILL.

February's single-digit temperatures highlight the importance of a good natural gas distribution system for the 1.7 million customers of Northern Illinois Gas, most of whom use the gas to heat their homes and water.

To improve analysis for designing and operating that system — which contains 26,000 miles of gas line — the utility, a subsidiary of Nicor, Inc., is moving its gas flow computing operation to a PC-based local-area network. The network will run a custom-built graphical modeling application and store the models on a fault-tolerant storage device.

"The graphical version makes interpretation of data faster and more obvious, and that improves decision-making," said Chuck Roberts, gas distribution manager. Not only does that mean better analysis of the cold weather needs but it also means big savings, he said.

### More for less

Better gas consumption analysis will allow the utility to determine more precisely the correct pipe diameter for new installations. Because narrower pipe is cheaper, a 2% reduction in the diameter of pipes in new installations will let the $1.4 million dollar system pay for itself in just over two years, Roberts said.

Currently, analysts pore over stacks of printed gas load data generated by the company's mainframes. They use the data, which includes pipe locations and consumption patterns of users on a given section of pipe, along with general rules of thumb to make certain that adequate amounts of gas flow under various conditions.

For major changes in gas flow requirements, such as the addition of a big new customer, the analysts alter portions of the mainframe program by using a text editor and running simulations. The data is used by gas distribution system engineers to draw maps and make judgments about installing new lines and maintaining and upgrading existing lines. Using these methods, the analysis for adding new customers can take up to five days to complete, Roberts said.

The problem is that the calculations take too long and are too labor-intensive to evaluate all of the possible scenarios for new installations. Plus, the hand-drawn maps quickly get out of sync with the newest customer information, Roberts said.

The new system will give planners desktop access to graphical models of the pipe system derived from the mainframe's data. The planners can test various scenarios in as little as a half hour and print updated color system maps for the maintenance crews, Roberts said.

**ON SITE**

**Northern Illinois Gas**
*Naperville, Ill.*

**Challenge:** To improve planning for the natural gas needs of 1.7 million customers.

**Technology:** Gas flow modeling software, a RAID disk array system and an Ethernet LAN with Intel 1486-based PCs.

**Anticipated benefits:** Better analytical abilities leading to cost savings; ability to respond quicker to new customers' requests for service.

The utility's move is "part of a broad energy industry trend" away from mainframe to client/server applications, according to Ronald Samuels, vice president of sales and marketing at Dwight's Energydata, Inc. in Richardson, Texas. "A lot of good [graphical PC and workstation] software is available now, so we're beginning to see migration in the industry away from expensive mainframe computing to LANs with PCs and workstations."

The Northern Illinois Gas system, which is in its final testing stage, includes custom-built client/server software from Stoner Associates, a developer of piping system model software in Carlisle, Pa.

"We color-code the pipe to indicate the quantity of gas flowing through it so planners can see at a glance what the model is trying to tell them," said Joe Kroon, Stoner Associates' vice president.

The software accepts daily customer location and uses data that is downloaded from the mainframe by an intercom gateway from DCA's Intercomputer Communications Corp. The software converts the data into working models or maps of the gas distribution system.

The mainframe is updated by a customer service department that takes "hundreds of calls each day" from customers requesting changes in service. By receiving fast and accurate feedback on customers' use, the engineers determine pipe size for new installations and replacements.

### RAID solution

Before moving the utility's critical modeling functions to a LAN, Roberts said he had to be sure that the data would be readily available and safe. He picked a redundant arrays of inexpensive disks (RAID) storage device from Micropolis Corp. in Chatsworth, Calif. The RAID system provides fault tolerance by writing data to several disks.

"If I lose a drive I can just recreate the data from another drive," he said.

System planners will access the models using five Intel Corp. 1486 PCs on an Ethernet network running Novell, Inc.'s NetWare. The utility also plans to install PCs in 13 stations throughout the state once it decides on a wide-area distribution scheme.

This company's first foray into client/server computing began in January 1992. Roberts said he expects the new system to be fully operational by the third quarter of 1993.

In 1994, the utility plans to add another level of analysis to the software that will let planners determine which nodes to shut down to isolate sections of the system during emergencies.

## NetCensus tracks systems, licenses

Tapping into ongoing sensitivity about software licensing issues, Tally Systems Corp. in Hanover, N.H., recently introduced software that automates the inventory of hardware and software residing on networked PCs.

Called NetCensus and announced at Networld '93 in Boston, it is aimed at network managers who have large systems to track and software licenses to enforce and at financial professionals who need precise inventories to predict upgrade costs.

The software runs on network operating systems, including Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines and Microsoft Corp.'s LAN Manager. It collects serial numbers for leading software packages such as Lotus Development Corp.'s 1-2-3, Microsoft's Excel, WordPerfect Corp.'s WordPerfect, Aldus Corp.'s PageMaker and Borland International, Inc.'s dBase IV.

For the major network operating systems, it includes identification of network shell and driver versions and local-area network addresses. The software also inventories hardware components such as type of PC, manufacturer, amount of storage, add-on board and monitor types.

The package — a network version of the company's 3-year old PCCensus — includes an automatic scheduler that performs inventories at specific times or whenever users log on.

Pricing starts at $149 for a five-user pack. — *Lynda Radosevich*

## SUDS automates software distribution

One of the big hits of the Networld '93 show in Boston was Frye Computer Systems, Inc.'s Software Update and Distribution System (SUDS), a PC local-area network software distribution and management system.

SUDS, which began shipping right before the show, provides automated software distribution and automated text and binary file updating or replacement. It works with both DOS and Microsoft Corp. Windows, supports multiserver wide-area networks and runs over all major LAN operating systems, including Novell, Inc.'s NetWare, Banyan Systems, Inc.'s Vines, Microsoft's LAN Manager and IBM's LAN Server.

The new product lets network managers set the rules by which files are placed on a client PC or file server. For example, a user with an old version of an application, 2M bytes of random-access memory and a Video Graphics Array monitor could get the appropriate update configuration. However, a user with no version of the application, 1M byte of RAM and a Color Graphics Adapter monitor could get another configuration that includes complete installation of the software — all with no user intervention required.

SUDS allows network managers to automatically select, delete, replace or edit any text file, including AUTOEXEC.BAT, CONFIG.SYS, WIN.INI and WIN.SYS files. Networld attendees said this capacity would save them considerable time by automating the installation, tracking and standarding on the configuration and application environment of their client PCs. — *Michele Dostert*

### LAN hardware

John Fluke Manufacturing Co. has introduced the Fluke 650 CableMeter, which was designed for testing unshielded twisted-pair and coaxial wiring for Token Ring and Ethernet networks.

The Fluke 650 CableMeter assists users in locating the area of faults and certifying local-area network cabling. Ethernet traffic and noise can also be recorded and monitored.

The product costs $1,695.

➤ *John Fluke Manufacturing*
*6920 Seaway Blvd.*
*Everett, Wash. 98206*
*(206) 347-6100*

### Workgroup software applications

Emerald Systems has announced that Xpress Librarian 2.0 will support Microsoft Corp.'s Windows for Workgroups when running on Novell, Inc. networks.

Xpress Librarian 2.0 is Windows-based backup and storage management software that, when used in conjunction with Windows for Workgroups, will back up every available file server to the tape drive and any other workstation running Windows for Workgroups, the company reported.

The product lets users monitor the use of server disk space. For off-line archiving, users can choose files or groups of files by selecting specified criteria.

Xpress Librarian 2.0 costs $995.

➤ *Emerald Systems*
*12230 World Trade Drive*
*San Diego, Calif. 92128*
*(619) 673-2161*

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**When Your Networks Are Complex, Your Choice Is Simple.™**

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Local-area networking

## Chipcom aims for higher speed nets

By Joanie M. Wexler
SOUTHBORO, MASS.

**■ Smart-hub vendor Chipcom Corp. last week mapped out its plan for helping local-area network users migrate to higher speed communications while milking existing equipment investments for as long as possible.**

The blueprint, which the vendor said will be filled in with product announcements and industry partnerships in the coming weeks, includes bundling LAN switching into Chipcom gear, eventually over a high-speed Asynchronous Transfer Mode (ATM) backbone.

The LAN-switching move parallels the migratory "network-per-user" concept pioneered by companies such as Alantec Corp., Kalpana, Inc. and Synernetics, Inc., which use various schemes for providing individual Ethernet users with their own private 10M bit/sec. LAN. This alternative allows companies to retain investments in desktop network interfaces while preventing several users from sharing — and eventually exhausting — network bandwidth.

Hub competitor 3Com Corp. resells the Synernetics technology in its 3GH high-end hub, although a separate wiring hub is required for cabling. Another competitor, Synoptics Communications, Inc., has a deal with Kalpana to integrate Ethernet switching into its devices.

"There are certainly pockets of people in large corporations with bandwidth constraints, such as those involved with technical, multimedia and image applications," said Lee Doyle, director of LAN research at International Data Corp., a research firm in Framingham, Mass. Doyle observed that doing network-per-user switching in a device separate from the wiring hub "makes it tougher to manage and integrate the network."

### Beyond Ethernet

Unlike its competitors, Chipcom indicated that it would extend the LAN switching concept beyond Ethernet to Token Ring and Fiber Distributed Data interface networks. Meanwhile, the company said it will provide backbone ATM products in late 1993 and desktop ATM networking in 1994.

Desktop ATM would require switching modules within Chipcom's OnLine Concentrator hub rather than an ATM backplane, said Dave Fowler, Chipcom's vice president of marketing.

However, Fowler indicated that "you may need a higher speed backplane, which I can't talk about yet."

"I'm not sure about ATM in particular, but the need for wider bandwidth is there," said Eric Olson, manager of network services and operations at Keyport Life Insurance Co. in Boston, a Chipcom shop. He said Keyport servers hosting policy administration applications are "over 50% utilized, and the network seems to be the bottleneck." Today, Keyport uses 10Base-T (Ethernet over unshielded wiring) LANs exclusively.

"We're challenged with performance issues all the time" because of the firm's widespread downsizing effort that is creating LAN-based, distributed computing, Olson said.

Fowler estimated that on average, corporate networks are growing five to 10 times faster than information services budgets. These grim figures are the rationale behind many networking vendors' efforts to help customers grow their networks incrementally.

## Options increase for T3 users

### Chunks of 45M bit/sec. links can now be more finely allocated

By Joanie M. Wexler
SANTA CLARA, CALIF.

Telecommunications network users are poised to gain tighter control over their burgeoning wide-area bandwidth this quarter.

T3Plus Networking, Inc. said it will soon support the channelized DS3 format on its BMX45 T3 multiplexer, which had supported only bursts of unchannelized traffic at speeds of up to T3, or 45M bit/sec.

With the addition of the new capability, organizations using T3Plus gear can interface with carrier networks and more finely manage the way they divvy up bandwidth throughout the public switched network. By channelizing traffic, for example, users can buy one T3 circuit and slice it into T1 (1.5M bit/sec.) or fractional T3 links that can be dropped off at locations throughout the public network. This is more economical than buying multiple point-to-point T1 or fractional T3 lines, said Alan Menezes, T3Plus' director of marketing.

Fractional T3 services are currently offered by AT&T and WilTel.

T3Plus shop Northrop Information Service Center in Pico Rivera, Calif., said it anticipates using the channelized capability as a "fallback to a T3 failure, where we can't afford to have an extra DS3 line sitting there for redundancy," said John Beecher, network technologist. In such a scenario, highest priority circuits would be routed over multiple T1s, he said.

In addition, he said, the capability might allow Northrop to "give service to customers in areas where T3 is not available but T1 is. We could buy multiple T1s and let the system inverse-multiplex them" across T3s in the backbone.

Inverse multiplexing on the BMX45 allows a multimegabit data circuit to be split across multiple channels in bandwidth increments of T1. Inverse multiplexing is available for under-T1-speed networking from vendors such as Ascend Communications, Inc. and Telcos Communications, Inc.

With T3Plus' announcement, "they can solve just about any of the basic T3 requirements," said Richard Malone, principal at Vertical Systems Group, a consultancy in Dedham, Mass. Vertical Systems estimated that roughly 2,040 T3 circuits were in use at the end of 1992 and expects that number to more than double by late 1994.

Channelized support has been available on unmanageable, lower end T3 multiplexers from phone switch makers such as AT&T, NEC Corp., Fujitsu Business Communications Systems and Alcatel Network Systems, Inc. Ascom Timeplex and Adaptive Corp. offer channelized support on more intelligent, manageable equipment.

T3Plus is the only vendor to support the unchannelized format as well, which is necessary for supporting packet-based traffic such as local-area network interconnect and emerging Asynchronous Transfer Mode traffic, he said.

T3Plus' unchannelized function has allowed users to accommodate, for example, 100M bit/sec. Fiber Distributed Data Interface internetworking at speeds greater than 1.5M bit/sec. But such a setup "was not very efficient for a whole group of applications that required consolidating separate T1 networks across T3 pipes," Malone said.

T3's 45M bit/sec. bandwidth will shift from being used primarily for consolidating T1 lines to LAN and host connectivity applications

Percentage use of T3 bandwidth by application

| | 1991 | 1992 | 1993* | 1994* |
|---|---|---|---|---|
| T1 consolidation | 61% | 52% | 43% | 31% |
| LAN interconnect | 12% | 16% | 20% | 24% |
| Host connectivity | 20% | 23% | 27% | 31% |
| Image | 5% | 6% | 7% | 9% |
| Video/Multimedia | 2% | 3% | 3% | 5% |
| Total leased T3 lines | 1,510 | 2,040 | 2,980 | 4,450 |

*Projected

Source: Vertical Systems Group — CW Chart: Michael Siggins

## LAN administrators empowered

### Suppliers beginning to offer ways to monitor power glitches

By Elisabeth Horwitt
BENTONVILLE, ARK.

It is a problem that has long plagued LAN administrators: A workstation, hub or server on a far-off local-area network has gone kablooey, but before you call in the hub or Token Ring circuit board vendor, you would like to be sure that the source of the problem is indeed the network, not the power supply.

With 2,000 stores nationwide, Wal-Mart Stores, Inc. is placing a high priority on finding a way to track surges, spikes and outages on remote LAN devices, according to Mike Fitzgerel, special project manager at the store chain. "The [power] units we have today may or may not survive a

Power glitches, *page 54*

A typical computer location experiences 443 disruptive or destructive power disturbances each year

Source: Computer Business Equipment Manufacturers Association

Network management

# Consortium gets to work

By Elisabeth Horwitt
SEAGIST, N.J.

Eight prominent vendors met here two weeks ago to discuss how to develop industry-standard management information bases (MIB) for managing IBM Systems Network Architecture (SNA) products via Simple Network Management Protocol (SNMP).

Particularly promising for the group's long-term viability was the presence of an IBM representative at the meeting.

The SNA MIB Consortium, founded by independent testing laboratory InterLab, defined an initial goal of getting the Internet Engineering Task Force (IETF) to sanction an SNA MIB working group at next month's IETF meeting, according to Michael Bowman, a spokesman from member company Netlink, Inc. who attended the meeting. Now under consideration are MIBs for managing SNA LAN gateways, traditional SNA devices such as cluster controllers and devices that send IBM Synchronous Data Link Control traffic across LANs.

IBM is considering whether to throw open to the group its MIB for managing Advanced Peer-to-Peer Networking, scheduled for release this quarter, an IBM spokeswoman said.

Delmarva Power & Light Co. would very much like to see a MIB for managing its Ethernet-attached McData Corp. SNA controllers via Cabletron Systems, Inc.'s Spectrum, its SNMP-based network management system, said John Scoggin, supervisor of network operations at the Newark, Del., utility. Right now, the controllers are managed by NetView, which makes them the "odd man out on the internetwork" and difficult for internetwork managers to monitor, Scoggin said.

Delmarva is currently looking at BlueVision, Cabletron's recently annnounced product to provide bidirectional links between Spectrum and Netview. "It's pretty kludgey and not inexpensive; [it would be] much better if McData supported an SNMP MIB," Scoggin said.

Metro Toronto is another organization yearning for an SNMP-based system to manage its "old SNA devices and the gateways that emulate them," as well as Cisco Systems, Inc. routers that handle its SNA traffic, said Charles Peyton, a consultant to the civic agency.

This would provide the agency with end-to-end integrated management of its current mixture of SNA and LAN devices, which share a network backbone, be added.

Representatives from Digital Equipment Corp., Rabbit Software Corp., Attachmate Corp., Sun Microsystems, Inc.'s BunConnect division, Systems Strategies, Inc. and Peregrine Systems, Inc. also attended the meeting.

Vendors such as Cisco, Cabletron and Sync Research Corp. said they intend to work with the consortium. Sync Research is expected to announce its own SNMP MIB this week.

### Networked PCs

An average of 51.4% of PCs are on LANs, according to a recent International Data Corp. survey of 202 IBM mainframe sites.

At the 79 sites that had more than 65% of their PCs on LANs, 36% said routers would be very important to their network strategies during the next two years.

# Power glitches

CONTINUED FROM PAGE 53

radical fluctuation in power. But regardless, we'll never know, if a Unix system goes down, whether [the cause] was the utility power going down to 50V" or a failure on the system itself, he said. "There would be an enormous payback in being able to tell."

Several leading power supply vendors used the recent Networld '93 in Boston to launch products directly aimed at companies such as Wal-Mart that want central management of power supplies on their enterprisewide LANs:

•Best Power Technology, Inc. introduced a new version of its Logic Voltage Monitor, which is said to monitor Best power supplies on Novell, Inc. NetWare servers and Microsoft Corp. Windows workstations in real time.

A PC user can display graphs to show whether voltage is spiking below or above a predefined range of acceptable power levels, a Best spokesman said. This, in turn, enables administrators to pinpoint potentially dangerous trends, such as a power supply overloaded with too many devices, and also determine whether a recent problem such as data loss or corrupted files corresponds to a voltage surge or sag, he added.

The product is a NetWare Loadable Module with a list price of $199. A DOS version is scheduled for release at an undisclosed date.

•American Power Conversion Co. in Kingston, R.I., and Network Security Systems, Inc. in San Diego announced products that perform "managed shutdown" of a variety of LAN devices during a power outage. This involves saving data and closing files before the uninterruptible power supply's (UPS) battery backup runs down, which takes about eight minutes.

Both American Power Conversion's PowerChute Version 4.0 and Network Security Systems' enhanced version of LANSafe II are said to support both Novell NetWare servers and Microsoft Windows workstations, as well as hubs and routers. Managing shutdown of a Windows workstation typically involves closing multiple sessions or applications running on-screen. Shutting down a hub means ensuring that it has first sent all data sent to it.

Before the advent of automatic safe shutdown products, LAN administrators "had to run around shutting off" LAN systems before batteries ran out during a protracted power failure, an American Power Conversion spokesman said.

PowerChute 4.0 is scheduled to support Novell's Windows-based NetWare Management System by the second quarter. List priced at $99, it is available immediately.

Network Security Systems' LANSafe II can also send real-time data on power supply voltage and status to a Novell NetWare Management System.

The product will support IBM's OS/2 2.0 and Unix systems in the April to May time frame, the vendor said. LANSafe II for Novell networks is priced at $135.

•Oneac Corp. in Libertyville, Ill., provides automatic system shutdown for NetWare, OS/2, IBM's LAN Server and LAN Manager and Unix systems, the vendor said.

Last week, Oneac announced the "SNMP-ready" On Series of rack-mounted UPSs for internetworking devices.

The product will support the emerging Internet Engineering Task Force (IETF) standard for managing UPSs via Simple Network Management Protocol (SNMP), due out later this year.

The other leading UPS vendors also promised support of the IETF standard.

Wal-Mart is looking at SNMP-based monitoring of its UPS systems, Fitzgerel said. "Being able to get statistics on power and turning individual plugs on and off would be real handy." Wal-Mart is encouraged by work at the IETF to develop an SNMP standard for monitoring UPSs, he added.

Downsizing

# Large-scale EDI staying on big iron

By Rosemary Cafasso

While many mainframe applications are being targeted for downsizing, electronic data interchange (EDI) applications are likely to stay on the bigger platforms for the near future, according to a recent survey by BIS Strategic Decisions in Norwell, Mass.

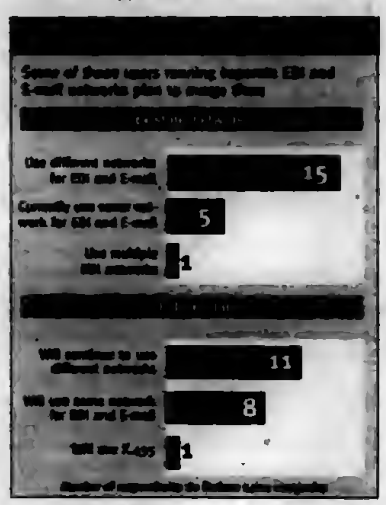
Large-scale EDI applications tend to be managed centrally, typically reflecting the centralized purchasing process at the user company, according to the survey.

As a result, companies also maintain separate networks for EDI and internal messaging, the survey showed, although many companies said they plan to merge these networks in the future.

"EDI would move at a slower pace to LAN [platforms] than electronic mail because it is really more akin to data processing than E-mail is," added Donald Ryan, vice president of telecommunications research at BIS Strategic Decisions.

BIS surveyed 20 corporate giants that had either implemented an EDI network or plan to within two years. Respondents included Hughes Aircraft Co., Bechtel Corp., Texaco Corp., Johnson & Johnson and Sears, Roebuck and Co.

The survey found that most users rely on EDI to improve their purchasing and invoice payment applications. However, EDI has begun moving into more strategic applications and, in some cases, is now playing a role in just-in-time systems.




Source: BIS Strategic Decisions CW Chart: Stephanie Faucher

Survey respondents said they expect more messaging traffic during the next two years at their companies, predicting an average of 1 million messages per month in 1994.

### Multiplexers, front ends

Network Devices, Inc. has introduced the Gemini Fiber-MUX, a fiber-optic multiplexer.

The product has the ability to locate the full eight ports of an IBM Application System/400 workstation controller more than 5 km from the host. The Gemini Fiber-MUX works in conjunction with the company's Gemini-2000 active hub.

Pricing begins at $2,215.

➤*Network Devices*
*8-11 Jan Sebastian Way*
*Sandwich, Mass. 02563*
*(508) 888-5200*

### Network management

Ki Research has announced OpenDNM, a product for managing Digital Equipment Corp. networks running on Hewlett-Packard Co.'s HP 9000s and the HP OpenView network management system.

OpenDNM is said to monitor, configure and perform fault resolution on DECnet Phase IV and local-area transport networks via a graphical user interface. It also displays remote systems memory, CPU and disk use as well as the number of users and processes.

The product is priced from $12,000 to $36,000.

➤*Ki Research*
*6760 Alexander Bell Drive*
*Columbia, Md. 21046*
*(410) 553-0181*

Fibermux Corp. has announced the Token Ring SmartLink (CC6682T).

According to the company, the SmartLink is the first network management module to maintain in-band network management communications during a beaconing fault. Compatibility is provided with IBM's LAN Network Manager and NetView. Network management can also be extended to Token Ring multistation access units that were unmanaged.

SmartLink has two Texas Instruments, Inc. TMS380 Token Ring controller chips and was designed for Fibermux's Crossbow line of multi-LAN hubs and LightWatch graphical Simple Network Management Protocol management software.

The product costs $4,995.

➤*Fibermux*
*9310 Topanga Canyon Blvd.*
*Chatsworth, Calif. 91311*
*(818) 709-6000*

### Gateways, bridges, routers

Telematics International, Inc. has announced nine frame-relay products, including backbone switches, adapters and access devices. The adapters and access devices were slated to ship last month, and the backbone switches are scheduled to ship in May.

The NetFrameXchange product line ranges in price from $3,400 to $150,000.

➤*Telematics International*
*1201 Cypress Creek Road*
*Port Lauderdale, Fla. 33309*
*(305) 772-3070*

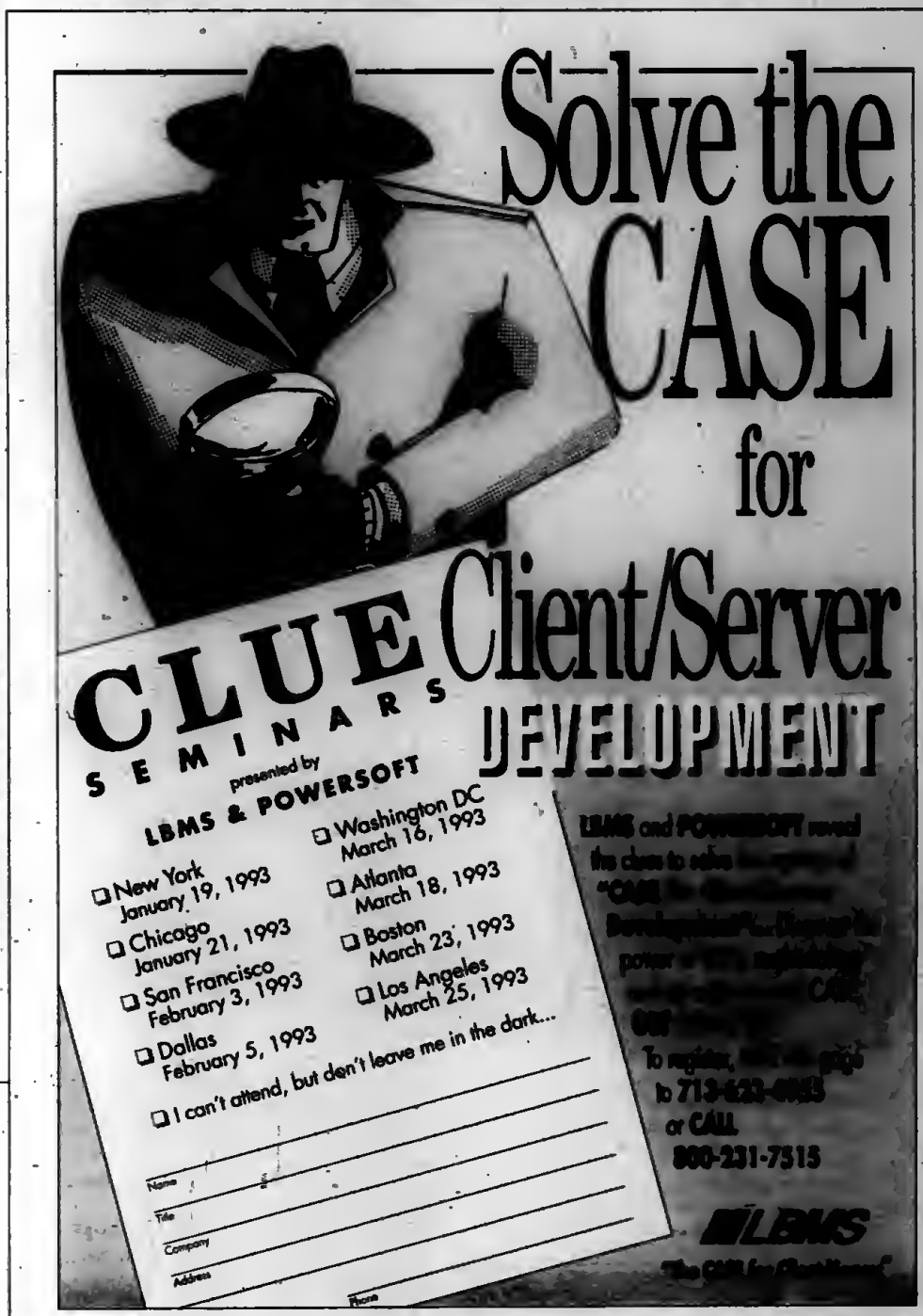
Engage Communication, Inc. has introduced the ExpressaRouter for Apple Computer, Inc. Macintosh computers.

The product connects local-area networks with digital phone lines, transmitting data among various locations seven times faster than standard phone lines. ExpressRouter is available with one or four ports and operates with switched or dedicated digital phone lines.

Features for ExpressaRouter include a selection of RS232, RS449 and V.35 ports and password protection for network dial-in security. Other options include inverse multiplexing and zone cloaking.

ExpressRouter costs $1,995.

➤*Engage Communication*
*9053 Soquel Drive*
*Aptos, Calif. 95003*
*(408) 688-1021*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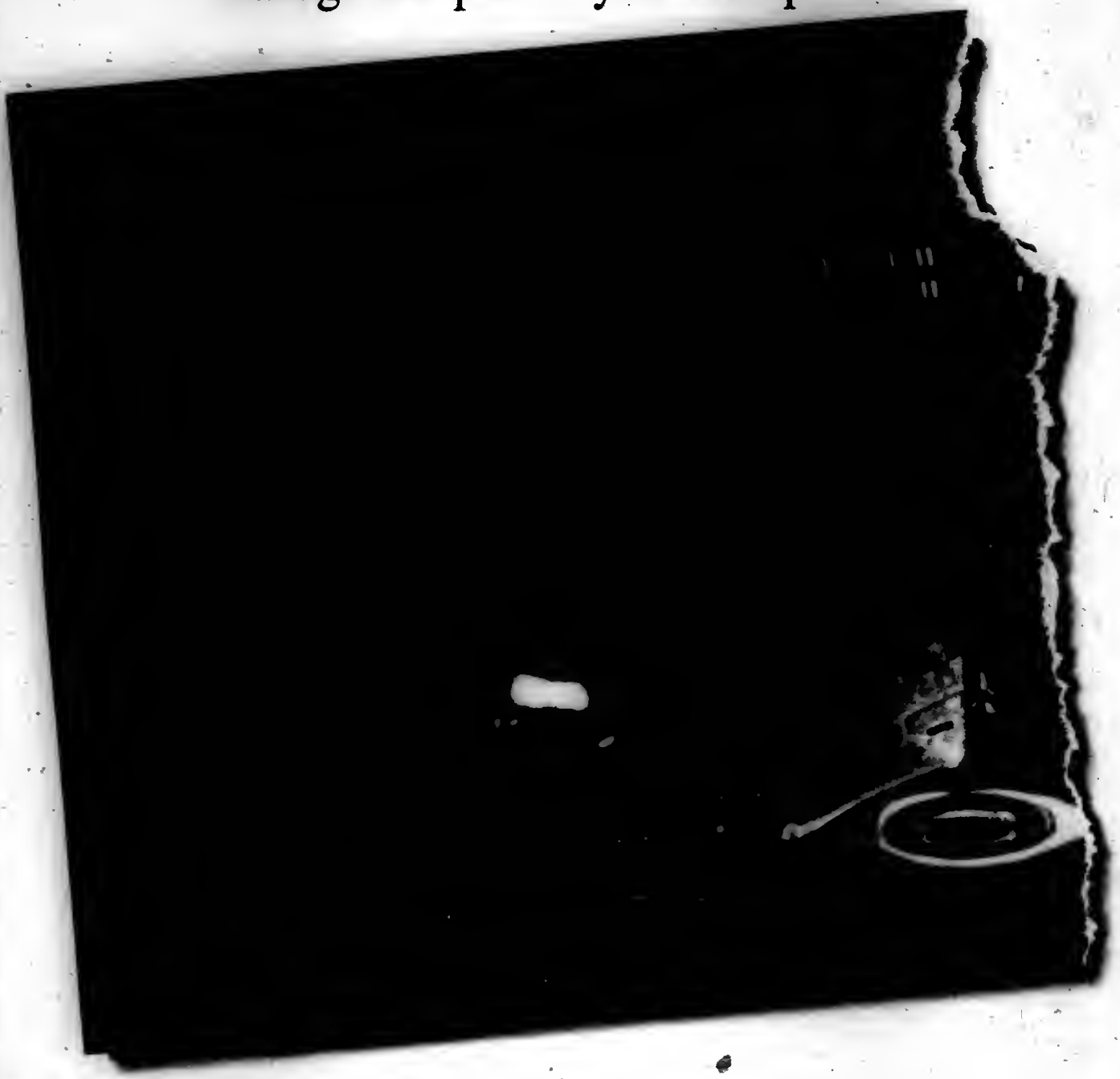

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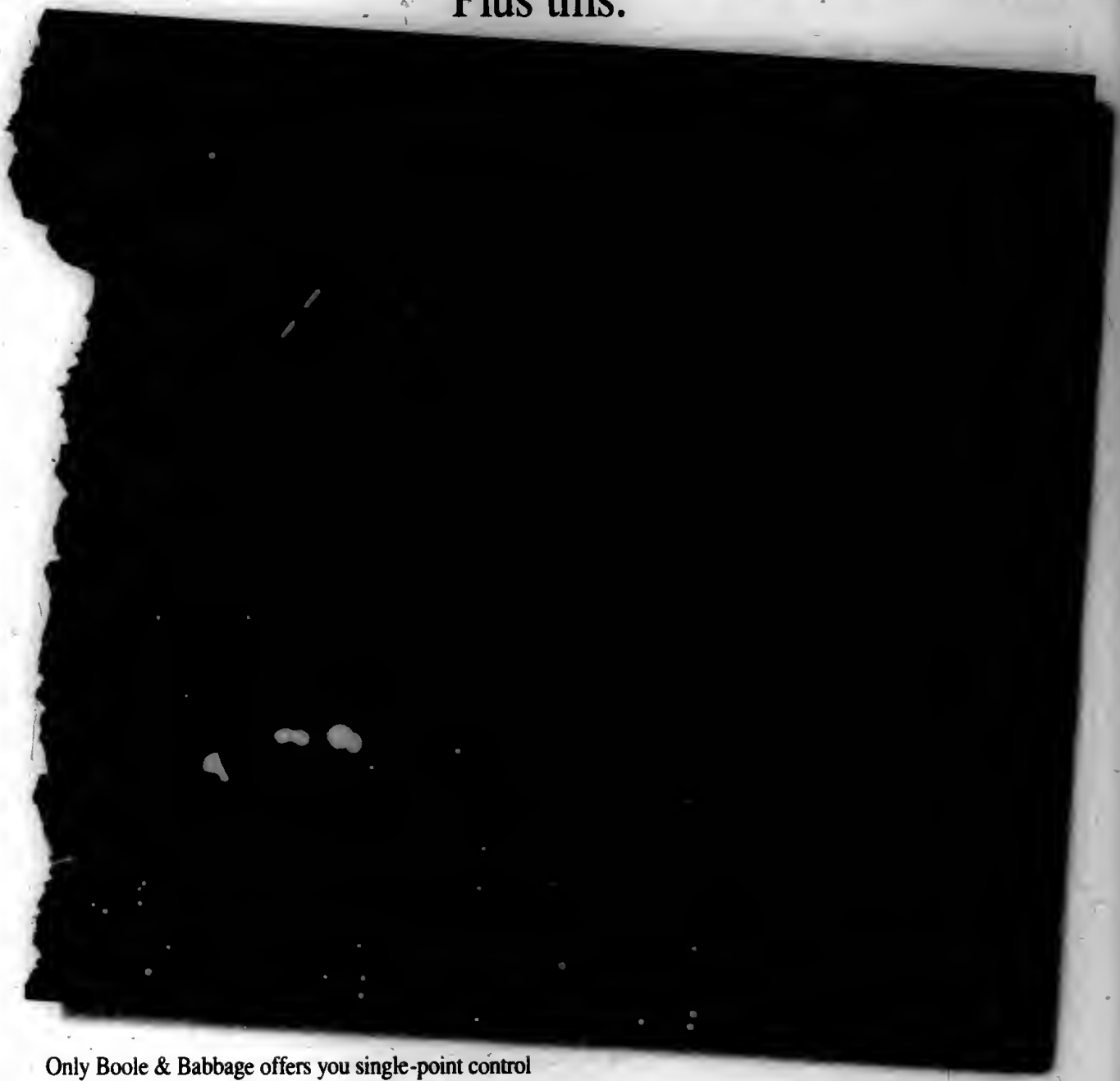

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Storage systems

# Distance from IBM helps Adstar

By Johanna Ambrosio

**■ IBM's storage systems business, Adstar, is well-positioned both financially and technologically, analysts said, but it will have to fight to keep its edge this year as it becomes more independent from its parent company.**

IBM-wide cutbacks in research and development may have some long-term negative effects on this extremely technology-dependent business, some customers said. They also noted there is little to differentiate one supplier from another in this cutthroat market. And some users said they are increasingly willing to purchase disk drives and other storage devices from IBM competitors.

Further, Adstar — like most of its siblings within IBM — is coming off a difficult year. Jon Judge, assistant general manager of marketing at Adstar, said 1992 revenue was "basically flat" compared with that of 1991, but the business is profitable. He added that it is difficult to compare the two years' financial results because "we have shifted our whole [financial] measurement system from retail to wholesale."

James Porter, president of research firm Disk/Trend, Inc., said IBM's worldwide disk drive revenue took a hit in 1992 because of "the softness in the mainframe business and the intense competition in the [PC] business. IBM has had several price reductions on their PC drives and is now charging less than half of what they charged a year before."

Another challenge will be to woo customers who have gotten used to shopping around. "IBM's competitive advantage isn't as strong," said Doug Underhill, vice president at CSX Technologies, Inc. in Jacksonville, Fla. "IBM generally gets there first but doesn't stay there for very long. There's equivalent technology from all the players."

Evan Wride, director of information systems at Nissan Motor Corp. USA in Gardena, Calif., recently bought third-party disk drives, an unusual purchase in his mostly all-IBM shop. "IBM's price was 30% higher. It was a cost choice. I didn't see a 30% difference in performance, service and quality," he said.

### Older drives

Also, some IS shops are using older disk drives as a cost-saving technique. "Why buy 3390 Model 3s when there's no appreciable change over the older model?" asked Tom Loane, vice president at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "We're buying used Model 2s."

Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn., said IBM will try to turn these perceptions around through more partnerships with large customers. "I expect to see more prototyping in user shops: going to the oil industry and asking what they need. Once it works, then Adstar will announce it as a general product."

There are several bright spots in Adstar's future. Most industry watchers characterized Adstar as being extremely well-run and said Adstar's increasing independence from IBM corporate will be to its advantage. Most expected Adstar to spin off into a completely separate company within a few years.

"If they are spun off, the rest of the computer industry will be much more prone to purchase products from Adstar," said Phil Devin, vice president of storage technologies at Dataquest, Inc. in San Jose, Calif. "The other computer manufacturers don't want IBM corporate to know what they're doing, and they're afraid that IBM demands could take priority in the factory."

Still, the OEM business is growing, Judge said — from $270 million in 1991 to $450 million in 1992. This year's expectation is for $850 million in revenue.

On the technology side, Judge said, the focus is on smaller, faster and ever-more-intelligent storage devices. Adstar is continuing to shift its manufacturing plants toward more 2½- and 3½-in. disks that will be used across IBM product lines, from the PC to the mainframe.

Adstar is also working on more intelligent software to manage the storage mix in large customers' shops, as well as on optical and tape units. A high-end redundant arrays of inexpensive disks device has been promised by the first quarter of next year.

Judge said IBM's cutbacks on R&D will not impact Adstar's ability to compete long term. "We've mapped ourselves to our competitors to make sure we're on the right track."

ON SITE

**Dallas Morning News**

**Challenge:** To absorb additional staff, circulation and advertising acquired from a competing newspaper while implementing new production system.

**Technology:** Based on Tandem Computers hardware and System Integrators software.

**Results:** System should handle increased user demands while adding multitasking and improved page layout.

# Acquisition speeds system upgrade

By Mark Halper
DALLAS

Technology at the *Dallas Morning News* is so overburdened these days that dealing with deadlines often means dealing with dead lines.

When crunch time hits, the paper's 8-year-old Digital Equipment Corp. PDP-11/84s typically run out of conduits for routing stories among some 320 writers and editors, as the system's 500 available queues, or "in/out baskets," fill up.

In other words, writing an article can represent merely half the battle for an intrepid reporter huffing and puffing to get it in on time. Sending it to the next stop in the editing process can pose just as large a challenge, usually one completely out of the writer's control.

"On evenings when we have special events, like bombings in Iraq, the system is incredibly slow," said Bonnie Rogers, news systems manager.

In the time-critical newspaper business, any glitch in the system can have dire consequences. As assistant managing editor Walt Stallings noted, a slowdown at the editing stage usually pushes back the rest of the production process, ultimately slowing delivery to 500,000 subscribers anxiously awaiting their first daily gulp of newsprint.

"If the paper's not there, it doesn't do them any good," Stallings observed.

Until the *Morning News* brings on line a Tandem Computers, Inc.-based system from Sacramento, Calif., integrator System Integrators, Inc., it is implementing a few stopgap measures. On particularly busy nights, its remedy is one that is the bane of all reporters — deadlines are pushed up.

But Stallings said that interim approach has not always been successful.

For instance, on the evening of Super Tuesday during last year's primaries, editors requested that reporters file their stories 15 minutes earlier than the usual deadline. Nonetheless, "when production time came up, we still had 17 stories backed up waiting to go out on deadline," he said.

The reporters were doing their jobs, but the

Newspaper, *page 61*

## In Brief

### Goodyear chooses SAP

**The Goodyear Tire & Rubber Co. will implement mainframe-based financial and manufacturing software from SAP America, Inc., the vendor said. The R/2 system is being installed in Goodyear's Akron, Ohio, data center.**

### Canadian utility downsizes

**Ontario Hydro is replacing its mainframe-based fixed-assets application with a PC running SunSystems accounting and financial software from Systems Union Canada.**

### Accepting nominations

**The Association for Computer Operations Management (Afcom) in Orange, Calif., is accepting nominations for its "1993 Data Center Manager of the Year" award. The award will be presented in April. For information, contact Afcom at (714) 997-7966.**

# Bank moves to Oracle on supercomputer

By Jean S. Bozman
AMSTERDAM

Frustrated by the throughput of conventional relational databases on IBM mainframes, one of the largest banks in the Netherlands is moving some of its time-sensitive IMS applications to a relational database management system running on a supercomputer.

ING Bank International is in the process of migrating some IMS-based equities-trading applications from IBM Enterprise System/9000 mainframes to a 32-node NCube supercomputer. If all goes as planned, the 50,000-employee bank will have several applications in production on mirrored Oracle Corp. databases this month. The bank's six ES/9000 mainframes handle 10 million transactions per day using IBM's IMS and VSAM file-oriented databases for CICS transaction processing and IBM's DB2 for customer accounts.

The bottom line for supercomputer databases will be better performance on $500,000 NCube machines at a fraction of the cost of multimillion-dollar IBM mainframes. "Our options-trading group needs operational information on a short-term basis," said Michel Hoevenaars, an information specialist at the bank. "All the trading data should be available as soon as some action has taken place, and I may assure you that in an IBM DB2 environment that is absolutely impossible." The bank plans to acquire NCube 3 supercomputers this year, he said.

The motivation for re-engineering was a need to process trading data as quickly as possible. "There is always a mismatch between the viewpoint of the users and the structure of the database," Hoevenaars said. He added that DB2 optimizers are used to speed performance and reduce response time. "What we wanted to achieve was to combine transaction processing and information retrieval in one operational environment."

Migration of IMS database applications was eased by earlier prototyping of Oracle 6.2 applications on the NCube beginning in July 1992. "We re-engineered the [mainframe] applications step by step," Hoevenaars said. Working with software engineers from Oracle headquarters in Redwood City, Calif., Hoevenaars' team of four created the NCube-compatible Oracle applications in two months.

The team used multiple NCube processors to translate flat files from IBM's IMS database into relational files for use in the Oracle database. "We used one node to translate one table," he said. "By using 32 nodes, we will be able to translate 32 flat files at the same time." The entire translation process from IMS to Oracle will take several weeks. The target is to start with a 30G-byte working database and grow it to about 200G bytes by 1994.

The first test of the Oracle 6.2 database, running since late December, was about 8G bytes, Hoevenaars said. The bank planned to have a new Oracle 7 database running in parallel with the first one by the end of last month.

Oracle 7 provides a parallel server option that allows two copies of the database to access the same data sets. Parallel processing will reduce the time needed for number-crunching large volumes of data. "If we really want to achieve massive production," Hoevenaars said, "we need to have parallel queries." Each of the NCube's 32 nodes has more than 16M bytes of memory available, he added.


## Who Will Be a Mobile Professional?

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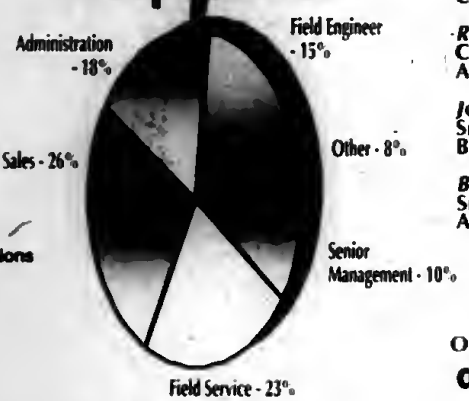


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# Newspaper

CONTINUED FROM PAGE 59

paper's technology was failing.

Even on a normal day, technology operations are helter skelter: Rogers races around the newsroom conducting intermittent roll calls in search of available computer space.

"I have to ask if people are gone, and can I delete their work queues," she said.

In fact, sometimes not only are there too few queues available, but the paper must also cope with a shortage of terminals on which reporters can write their stories.

The *Morning News* has been stretching the PDP system — which runs the DEC IAS Plus operating system and a DEC software program called Text Management System — for several years. However, the paper's acquisition a year ago of the assets of rival *Dallas Times Herald* exacerbated the PDP's shortcomings.

With the acquisition, the *Morning News* picked up circulation, reporters and pages, an across-the-board increase in operations that has taxed the PDP system beyond reasonable limits.

Choosing the System Integrators' system over other options was an easy decision for the paper because the *Morning News* had acquired the system in its *Times Herald* buyout. The *Morning News* had been considering a solution from Digital Technology International in Orem, Utah. But, with System Integrators equipment suddenly available, the Digital Technology evaluation became a moot matter.

Stallings said he is looking forward to features in the System Integrators system that are not part of the DEC system, such as multiple split screens, messaging and multitasking, which will allow him to run line-justification programs while he tends to other editing chores.

The System Integrators system also provides "area" text layouts that replicate the final look of a page, rather than "galley" layouts that simply provide text in columns, which then have to be manipulated into a page design. It is also capable of receiving more wire services than the DEC system, which tops out at 14, Rogers said.

System Integrators is installing eight Tandem servers, four live and four backups, each with 8M bytes of memory. It is also adding 157 of its System Integrators Coyote PCs to the hardware mix, which includes 149 Coyote terminals that the *Morning News* acquired from the *Times Herald*.

The integrator has transferred the *Times Herald*'s license to the *Morning News* and is providing staff training.

Rogers said the *Morning News* will look for buyers for the antiquated Intel Corp. 80286-based PCs it currently uses and for some of its four DEC minicomputers. It plans to hold on to at least one of its DEC machines to receive election results.

The paper plans to phase in the new system starting with less deadline-intensive sections, such as features, in April. It hopes to complete installation by the beginning of the high school football season in early September, a particularly demanding time in the world of Texas news reporting.

Until that time, the *Morning News* hopes to continue to avoid its worst nightmare.

"Our greatest fear has been that we can't get the paper out," Stallings said. "It's never happened, but it's been the fear in everyone's minds."

[redacted]

### Software application packages

B.O.S. Software Technologies has introduced BOS-Complement 1.0, a software product for IBM's VTAM.

The product was designed to provide every mainframe system environment running under VTAM the ability to create on-line documentation and pop-up help windows with a PF-Key. All IBM subsystems are supported.

Pricing ranges from $75,000 to $125,000.

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### Data storage

Aquidneck Systems International has announced the Optical Disk Silo Manager (OSDM), a storage subsystem running under IBM MVS.

According to the company, the optical storage and retrieval system accesses data stored in one or more optical disc autochangers, functioning transparently with utilities and user applications. Mainframe-based client/server technology is used, and OSDM supports LU6.2, IBM's Advanced Program-to-Program Communications.

For enterprisewide management of the optical storage complex, users can configure OSDM with the company's Optical Disk Communications Server and with as many optical storage subsystems as needed.

Prices range from $125,000 to $425,000.

➤*Aquidneck Systems International*
*650 Ten Rod Road*
*North Kingstown, R.I. 02852*
*(401) 295-2691*

### Software application packages

Systems Design & Development, Inc. has introduced the Telecommunications Call Manager/400 (TCM/400), call accounting software.

By using monthly and quarterly rate table updates, users can trail and post outgoing telephone calls, the company reported. TCM/400 is fully integrated with IBM's Application System/400 and S/38 computers and offers capabilities such as unlimited storage capacity, record retention, high-speed processing and report generation.

Features include multiple phone switches and multiple site processing and incoming call record-tracking.

TCM/400 prices range from $8,000 to $30,000.

➤*Systems Design & Development*
*Atrium Financial Center*
*Suite 412*
*1515 N. Federal Highway*
*Boca Raton, Fla. 33432*
*(407) 367-1648*

### Database management

BMC Software, Inc. has released Version 3.2.03 of Change Manager, Alter, DASD Manager and Catalog Manager, DB2 administrative products.

Change Manager and Alter now offer support for View-Text Validation. According to the company, View-Text Validation enables the products to perform the required syntax, analysis and consistency checking needed when automating modifications across production subsystems.

Change Manager also supports Location Grouping Identification and a new Info command that maintains catalog statistics by allowing a feedback loop to computer-aided software engineering tools.

Catalog Manager has a new Explain command, and DASD Manager offers an improved space estimation facility and enhanced statistical data collection.

Prices range from at $8,000 to $26,000.

➤*BMC Software*
*1 Sugar Creek Center Blvd.*
*Sugar Land, Texas 77487*
*(713) 240-8800*

### System software

Platinum Software Corp. has announced new modules for Sequel to Platinum and Platinum Premier Financial Applications.

A scalable architecture that uses the advanced features of Microsoft Corp./Sybase, Inc. SQL Server is incorporated in Sequel to Platinum. These features include a suite of accounting applications, remote stored procedures and database triggers.

Accounts payable and accounts receivable modules are available for Sequel to Platinum, with prices ranging from $10,000 to $100,000 per module. Pricing for Platinum Premier Financial Applications starts at $3,000 and includes currency translation, consolidations and intercompany processing.

➤*Platinum Software*
*Suite 300*
*15615 Alton Pkwy.*
*Irvine, Calif. 92718*
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For the second consecutive year, PROGRESS resoundingly swept all 18 categories of the VARBUSINESS Report Card. And for the fourth year in a row, PROGRESS came out on top in the Datapro surveys. Once again, users rated PROGRESS superior to all competitors on everything from strength of product to quality of service and support. Which is only logical, since PROGRESS is the one development system that gives you the flexibility to build and implement high performance applications independent of platforms and database systems. It even lets you deploy any application in both multi-user and client/server environments. But don't just take our word for it. Listen to a source far more convincing. Your peers. Call 1-800-4 PROGRESS for survey results or a test drive.

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CPWADV0201

In Brief

### XVT Partners adds new members

User interface tools vendor **XVT Software, Inc.** in Boulder, Colo., announced that 10 companies have recently joined its XVT Partners Program.

Charter members of the program include the following: **CASEworks, Inc.** in Atlanta; **Object Design, Inc.** in Burlington, Mass.; **Unisys Corp.** in Blue Bell, Pa.; and other companies.

The partners will share technical and marketing information with the maker of portable user interface design tools.

### Visual Edge port

**Visual Edge Software Ltd.** has made its UIM/X 2.0 interface development tool available for use with object-oriented database applications.

The Montreal-based company said UIM/X can now be used to develop interfaces for the Objectivity/DB object-oriented database from **Objectivity, Inc.** in Menlo Park, Calif.

# CASE tool ups productivity 50%

By Garry Ray

The Japanese Fifth Generation project of the 1980s may have fallen into obscurity, but a development tool spawned by the effort is marking productivity gains at the U.S. Patent and Trademark Office in Arlington, Va.

According to Kevin Petrucelli, a computer specialist at the agency, development efforts are reaping 50% productivity improvements with an integrated computer-aided software engineering (CASE) workbench called Daisys from S/Cubed, Inc. in Stamford, Conn.

The tool, he said, "takes a totally new approach to building systems" for the agency's jump into client/server application development.

The patent office decided about a year ago to consider new tools for its planned Patent and Trademark Copy Sales Order Entry Management System.

The system was needed to process the 2,000 to 4,000 daily requests for patent and trademark information. The requests are made primarily by patent attorneys.

Development of the system was initially launched using Oracle Corp.'s SQLForms development tool. However, the patent office also became acquainted with S/Cubed's Daisys at about the same time and decided to launch a pilot project of parallel development.

"We thought it was smoke and mirrors, so we brought it in for a working evaluation," Petrucelli explained. "One person built the system in Daisys and another in SQLForms."

Even with the learning curve of four months, the Daisys programmer was able to complete a working application at the same time as the Oracle coder.

Having proved the concept, the patent office decided to redevelop its older Appeals Case Tracking System (Acts) using Daisys.

According to Petrucelli, Acts is used to track about 40 previously denied patents that are appealed every month.

**Out with the old**

But Acts had become dated over the years. Originally written for the patent office by a contractor using Ashton-Tate Corp.'s dBase III+, it had become difficult to maintain. A prime candidate for a redevelopment project, it became the second working test of Daisys, Petrucelli said.

After about three weeks of development, the new Daisys version of Acts is now complete. It includes 15 Oracle database tables and 87 processes, including updates, adds and deletes, and it consists of 4M bytes of C and SQL source code, Petrucelli said.

The code will be compiled and executed on a Sun Microsystems, Inc. SPARCstation. An upcoming host-based project using Daisys will eventually support 1,700 users, he added.

Petrucelli said that many of the expert systems features derived from the Japanese Fifth Generation computer project are noticeable in the workbench. "It draws diagrams, develops documentation and does qualitative workflow analysis for you."

Analysts have also praised the little-known development tool. "I see it as visionary," said Mickey Williamson, editor of "CASE Strategies," an Arlington, Mass.-based industry newsletter. "It captures the roles of people, the jobs they carry out and the forms they use."

But, like Petrucelli at the patent office, Williamson was initially quite skeptical. S/Cubed "claimed a great deal that no one else was claiming. It would be better if they made mistakes in their demos," she said.

ON SITE

**U.S. Patent and Trademark Office**
*Arlington, Va.*

**Challenge:** To redevelop older applications and design new ones, using CASE tools and client/server technology.

**Technology:** The Daisys CASE workbench from S/Cubed, Inc. in Stamford, Conn.

**Results:** An estimated 50% increase in productivity after one pilot project and a production application now ready for deployment.

Object-oriented databases

# Objectivity/DB 2.0 ships

By Melinda-Carol Ballou

MENLO PARK, CALIF.

Objectivity, Inc. has introduced a new version of Objectivity/DB, the company's object-oriented database that offers easier administration for distributed databases and ad hoc query capabilities using SQL, company officials said.

Other features that are new with Version 2.0 include distributed schemas that can now be shared by application developers for easier development of related applications, detachable databases for more flexible distribution of data and on-line incremental backup.

"Detachable databases let users take a database that has links to other databases, like a component library, detach and move it somewhere else," said Craig Woods, director of marketing at Objectivity. "And with the backup, you don't have to bring down the entire system to back up a network of databases."

Previously, users made queries using C++, but now they can use SQL, he added. Version 2.0 of Objectivity/DB also lets users upgrade deployed applications via schema evolution and object migration capabilities, new administrative tools and programmatic interfaces so that developers can include database administration functions in their applications, officials said.

Objectivity/DB Version 2.0 is shipping now, and pricing ranges from $9,000 to $18,000 for a developer's version and from $200 to $500 for a runtime license. It runs on Unix workstations from Digital Equipment Corp., Hewlett-Packard Co., IBM, Silicon Graphics, Inc. and Sun Microsystems, Inc., as well as on DEC's VMS.

# Get a Grasp on multimedia

By Christopher Lindquist

Computer-based training, kiosks, electronic publications and advertisements: These are but a few of the "real-world" applications for multimedia that get mentioned when you ask, "What is multimedia good for?"

And, users said, if you want solid multimedia performance from even low-end hardware combined with robust development tools, Multimedia Grasp by Paul Mace Software, Inc. in Ashland, Ore., may be the way to go.

Grasp has existed for several years, starting as a shareware package, and has recently been "split" by Mace into high-and low-end versions: Multimedia Grasp for large-scale, commercial-grade projects and Visual Grasp for "point-and-click" presentation creation.

Multimedia Grasp is aimed at developers who want to create "bulletproof" multimedia applications for commercial settings. It includes a paint program, file conversion tools, sound, picture and animation support, a font editor and a code library for C programmers.

"Nothing else even comes close in DOS-based multimedia," said Don Magnusson, a contract programmer in Atlanta who has written a variety of multimedia applications using several tools, including Multimedia Grasp. "If you want the monitor to get up and dance around the room, it'll do it."

And that's not an exaggeration, he said. One of Grasp's most powerful features is its abilities as a complete development language, right down to controlling the serial ports on a PC. That capability could even control a robot that could make the monitor do a jig, a polka or whatever else you might desire.

Such control also allows developers to fine-tune programs to make sure they will run on a variety of hardware configurations without crashing or speed problems. Control comes at the cost of ease of use, however.

"You pay a price for the power," said Steve Ginsberman, president of Enlighten in Ann Arbor, Mich. "There is a learning curve."

Multimedia Grasp is scheduled to be available by the end of next month for a list price of $1,195. Visual Grasp is due within the same time frame for $149.95.

# Adabas gets Fed's OK

## SQL Server certified for ANSI SQL compliance

By Gary H. Anthes
BESTON, VA

Software AG of North America, Inc. announced that its Adabas SQL Server, which allows SQL access to the company's database management system from applications running under MVS or Unix, has received the federal government's certification for ANSI SQL compliance.

Certification required that the software pass some 300 tests administered by the National Institute of Standards and Technology (NIST) for compliance with Level 2 of ANSI SQL89. Certification for both MVS and Unix ensures portability of applications and databases across those environments, Software AG said.

The announcement marks the logical conclusion in a change in thinking about SQL at Software AG. The company had rejected the database access method as too simple and too inefficient but was ultimately forced by users to support it.

According to John Logan, an analyst at Aberdeen Group in Boston, the announcement is important for Adabas users contemplating downsizing from MVS to Unix and for anyone not sure of Software AG's commitment to SQL. "They wanted to show the world, 'We were wrong, and we want to show you how wrong we were. We are absolutely, positively 100% SQL-compliant according to the NIST standard.'"

Mike Schiff, director of the data management program at Software AG, said the announcement should also help lay to rest the image of the company as a mainframe-only firm. "Adabas is ... a truly portable database."

Schiff said users should see a large increase in the number of third-party software packages generating SQL commands that can be used with Adabas.

Adabas SQL Server was certified for Cobol and C. It complies with the government's Federal Information Processing Standard 127-1, which Software AG said is becoming a de facto standard in the commercial world as well.

On Unix, the product costs between $400 and $20,000; on MVS, it is priced between $37,800 and $89,800.

# Tool connects seamlessly

By Garry Ray
WALTHAM, MASS.

A recently unveiled software development environment could provide a seamless connection between the design, documentation and coding of C and C++ programs, according to the environment's makers.

ParaSet, which was announced last month by Software Emancipation Technology, Inc. in Waltham, Mass., is intended to link the components of the software life cycle and "describe all of the relationships in the source code," according to Peter Weyman, vice president of product development.

The ParaSet tools, which comprise structured and object-oriented designers, editors, browsers and documentation aids, are linked to one another so relationships are maintained throughout the software life cycle, the firm said.

For example, changes to a variable in program source code would automatically be reflected in the program documentation; adjustments made in the debugger would be added to the entire program. An optional interpreter allows execution of code under development; another optional tool provides analysis and restructuring of existing source code.

Unlike many integrated computer-aided software engineering tools, ParaSet does not mandate the software engineering methodology, said Vladimir Geisberg, the firm's president. "I don't know whether it's programmer psychology, but it's improbable that [programmers] would use any methodology."

Currently in beta testing, the $7,500 environment will ship for Unix platforms next month, the company said.

# DECforms update adds OSF support

Digital Equipment Corp. announced the next release of DECforms, the company's forms presentation software. The product will add support for the Open Software Foundation's Motif on OpenVMS for development and runtime environments, as well as a converter to ease the task of adding Motif support to existing DECforms applications.

DECforms currently offers developers a set of software tools and a runtime environment for implementing friendlier interfaces for character cell VT-class platforms on OpenVMS VAX and Ultrix reduced instruction set computing platforms. The upcoming VT terminal-to-pixel layout converter will enable users of DECforms on VT terminals to facilitate the transition to more easily access graphical user interfaces. It will also be available on Alpha AXP machines running OpenVMS.

The update will be released during the second half of 1993, and additional features will include multiline text fields, support for Adobe Systems, Inc.'s PostScript printing using Digital Data Interchange Format files and integrated support for Asian languages.

*—Melinda-Carol Ballou*

[redacted]

### Code libraries

EMS Professional Software has added 66 new products to its PD/Shareware C/C++ Utility Library.

According to the company, the library consists of 854 products written for C/C++ language users by an assortment of authors.

The products are compressed with Pkzip and are optimally stored on a single CD-ROM or 39 1.44M-byte disks. The library includes a database that describes and indexes each file. Users can type in vendor, name or free search to find a specific type of C/C++ routine or program.

The library costs $99.50 on CD-ROM and $149 on disks.

➤*EMS Professional Software*
*4505 Buckhurst Court*
*Olney, Md. 20832*
*(301) 924-3594*

### Application development tools

Information Builders, Inc. has announced Release 5.8.1 of Focus for IBM's Application System/400.

According to the company, the product incorporates Modify, a data maintenance facility for the OS/400 database with an SQL Read/Write interface.

Focus offers capabilities such as formal statistical analysis functions, a Focus "windows" feature and the automatic conversion of a report into graphics.

Multiple users can simultaneously maintain data with the Focus Modify for OS/400. Features include an automatic referential integrity that updates related files automatically. A full screen editor, a dialog manager, extended matrix reporting and an automatic window-driven report writer called TableTalk are also offered.

Focus for AS/400 Release 5.8.1 prices range from $3,000 to $100,000.

➤*Information Builders*
*1250 Broadway*
*New York, N.Y. 10001*
*(212) 736-4433*

Blackboard Technology Group, Inc. has announced GBB for Franz, Inc.'s Allegro Common Lisp Version 4.1, running on Hewlett-Packard Co. Apollo 9000 Series 700 workstations.

According to the company, GBB is a complete development framework for constructing intelligent software applications based on the blackboard approach.

The product offers knowledge modules that can be written in Common Lisp, Fortran and C languages; they use inferencing techniques that target the problem the knowledge modules are trying to address.

Blackboard applications and distributed blackboard applications can be built with GBB's knowledge source representation languages, graphics facilities and flexible control mechanisms, the company said.

GBB costs $10,000.

➤*Blackboard Technology Group*
*401 Main St.*
*Amherst, Mass. 01002*
*(413) 256-8990*

Scientific and Engineering Software, Inc. has introduced the SES/objectbench, an object-oriented analysis tool set.

The product consists of a graphical modeling tool for designing object-oriented analysis models, plus an animated simulator for studying the dynamic behavior of object-oriented analysis models, the company reported.

A range of static and dynamic verification is provided with a designing capture capability. Users can characterize execution behavior and "see" messages moving among objects.

The product is available on Sun Microsystems, Inc. Scalable Processor Architecture platforms.

Pricing begins at $4,900.

➤*Scientific and Engineering Software*
*Building A*
*4301 Westbank Drive*
*Austin, Texas 78746*
*(512) 328-5544*

Viking Software Services, Inc. has introduced Portal, a multiplatform software product.

According to the company, Portal was designed to dramatically reduce application development time for users.

A character-based user interface tool kit and application generators are provided. Full-screen displays, pop-up menus, cursor navigation and data fields are included for applications that do not require a graphical user interface, the company said.

A number of screen and data field attributes are available, such as word-wrap text fields, table look-ups, field-edit routines and scrolling windows.

The base price for Portal is $700.

➤*Viking Software Services*
*Suite 100*
*4808 E. 67th St.*
*Tulsa, Okla. 74136*
*(918) 491-6144*

Dynamics Research Corp. has announced a new version of AdaMat, the company's Ada measurement and analysis tool.

According to the company, the product is a source code analyzer and [illegible] metrics tool that is integrated with the Verdix Ada Development System (VADS).

AdaMat assists users in measuring code to see if it adheres to good Ada programming practices and quality software engineering principles, the company reported.

Code can be analyzed directly off the baseline development system because of AdaMat's integration with the VADS program library.

An initial license costs $9,995. Additional seats cost $5,000. Network licenses start at $18,000.

➤*Dynamics Research*
*60 Frontage Road*
*Andover, Mass. 01810*
*(508) 475-9090*

# Both Mainframe And LAN A Huge Headache...

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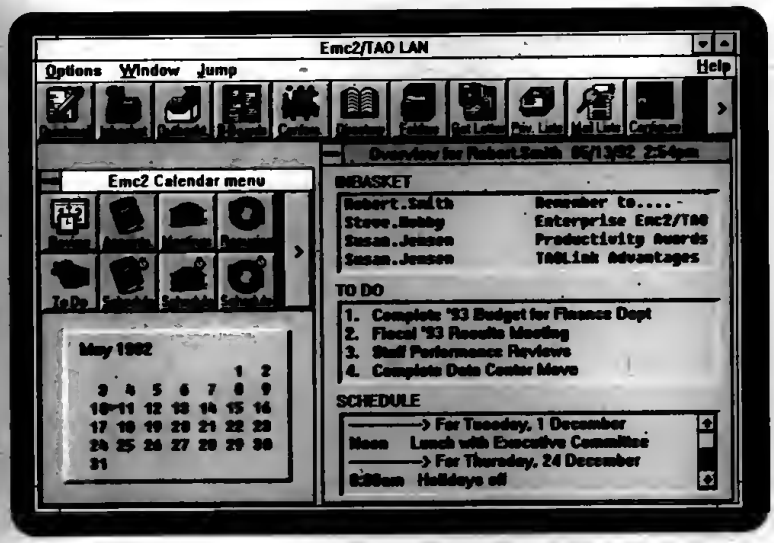
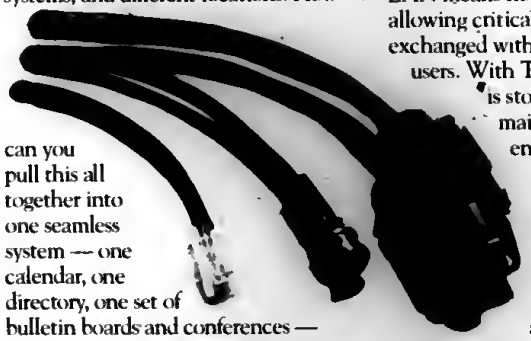



directory. Moreover, one set of gateways is made available for all users, host and LAN.

Imagine for a moment that you have mainframe users on CICS and VTAM; you have 5250 users on AS/400; and you have Windows users everywhere who are demanding a user friendly GUI mail system. You now have different hardware, different operating systems, and different locations. How



can you pull this all together into one seamless system — one calendar, one directory, one set of bulletin boards and conferences — and still have a manageable system?

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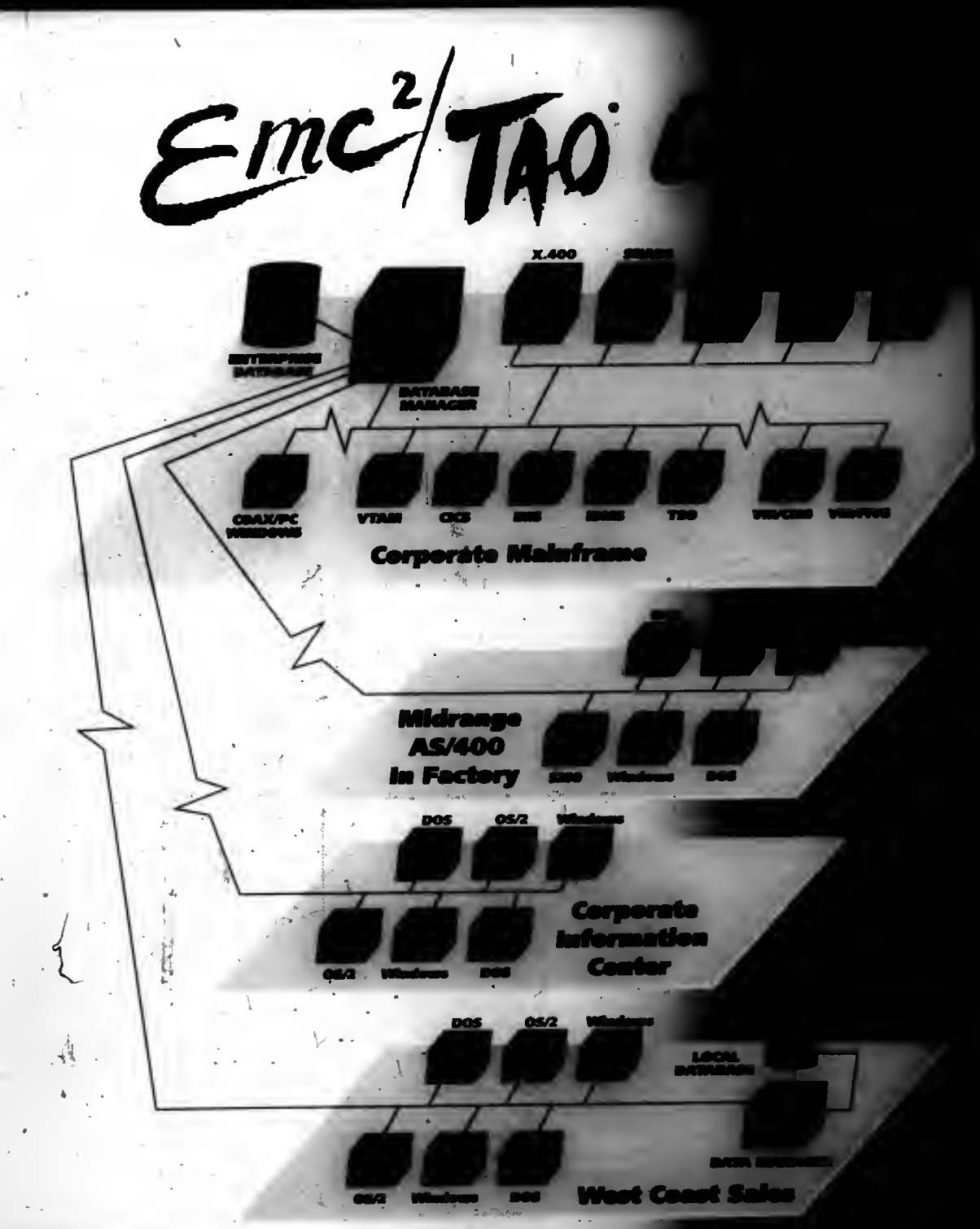
TAOLink is your insurance policy for the future — a world of constantly changing technology, a world of downsizing, rightsizing, new operating systems, and innovations as yet undreamed of. In this atmosphere, organizations are almost forced into becoming a veritable patchwork of technologies — often wildly different technologies.

And with TAOLink, there is no need to worry about data integrity on LANs. No data residing on the LAN means no anxiety about allowing critical data to be exchanged with host and LAN users. With TAOLink all data is stored in the secure mainframe environment.

Finally, TAOLink conserves mainframe CPU cycles with the use of TAOLink MVS, an LU6.2 application that links the host based Emc²/TAO Database Manager with the distributed mail application on the LAN. What this means is that users can take advantage of the computing power on their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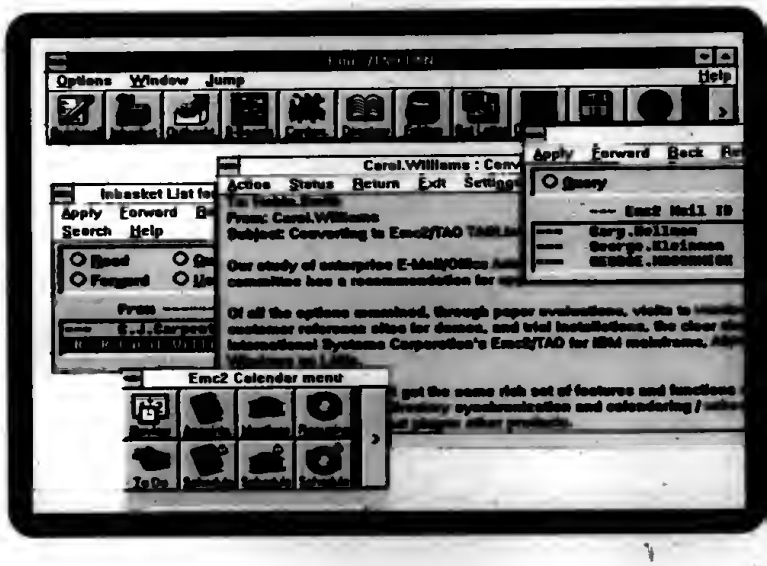
The Fully Distributed Database approach to **Emc²/TAO LAN** distributes the **Emc²/TAO** Database and Database Manager to the LAN environment allowing true workgroup processing for LANs. The **Emc²/TAO** networking feature, also an LU6.2 application, allows seamless exchange of mail between host and LAN users, as well as preserving functionality often lost with gateway connections.

**Emc²/TAO LAN** consists of the server PC and the client PCs communicating via Novell IPX or IBM NetBIOS. And, unlike other LAN mail systems, **Emc²/TAO LAN** doesn't require file server resources — that is, it doesn't burden the file server to provide mail transport. The database manager program runs under OS/2 EE and accesses the physical **Emc²/TAO** database located on that PC's hard disk. The client PC Mail program runs under Microsoft Windows or textual DOS.

## MIX AND MATCHABILITY:

Another unique feature of **Emc²/TAO LAN** is the ability to "mix and match" the TAOLink option with a fully distributed database option. What does this mean to you? It means that if you have more than one LAN, you can choose to use TAOLink for one LAN and Fully Distributed **Emc²/TAO LAN** for another — you can even choose to use both on one LAN. You can "mix and match" secure in the knowledge that you have just the level of electronic mail services you need for that LAN — without buying expensive options you don't need.




## MAIL SERVICES WHERE YOU NEED THEM:

**Emc²/TAO LAN** gives direct access to multiple mainframe and LAN environments via a central database. That means you get the same mail services, the same calendaring, and the same directory — whether you are connected to a LAN, a midrange, or a mainframe.

## SCALABILITY:

**Emc²/TAO LAN** can meet present workgroup needs — and as your requirements grow and expand, you can extend **Emc²/TAO** to other LANS and mainframes. **Emc²/TAO LAN** can "scale-up" from serving a single workshop to supporting enterprise-wide operations. You can also downsize or migrate from one platform to another — and take your data with you! No other product can make such a claim.

## SECURITY:

Worried about the confidentiality of your communications on the LAN? No need to worry with **Emc²/TAO LAN**. It has the same security features expected of a true enterprise system and that are inherent to **Emc²/TAO** such as confidential mail, use-restricted mail, password protection, and mainframe security protection with TAOLink.

## CENTRAL BACKUP/ RECOVERY:

Afraid you might lose critical information and man hours with LAN hard disk crashes? Don't worry. Through TAOLink and **Emc²/TAO's** Advanced Recovery Facility all your work will be saved in the event of a hardware failure.

## ENTERPRISE CALENDARING/ SCHEDULING:

Emc²/TAO LAN provides the identical, full-featured calendaring and scheduling capabilities that are found in the mainframe version of Emc²/TAO. Emc²/TAO LAN users have complete access to all of the calendaring and scheduling functions via the central server. Now users on any platform share the same calendaring system. Other electtonic mail LAN products available today require separate calendars for every distributed database — an inefficient and frustrating way to do business.

## ENTERPRISE BULLETIN BOARD/ CONFERENCING:

The bulletin board and conferencing capabilities available with Emc²/TAO LAN provide enterprise-wide central filing and forums for group discussion with automatic tracking of new messages. Again, other products require duplicating bulletin board and conference information.

## CENTRAL GATEWAYS TO THE WORLD:

Want to communicate with somebody in Australia — or anybody anywhere? Emc²/TAO LAN allows users to be linked to other users anywhere in the world either directly or through value added networks like AT&T, MCI, Sprint, and IIN. Emc²/TAO LAN accomplishes this using gateways such as X.400, SNADS, MHS, SMTP and many more, including Fax.

## CENTRAL DIRECTORIES:

You have one enterprise — why have more than one electronic mail directory? With TAOLink, directory synchronization issues disappear. Mainframe and LAN users see the same single directory.

## THE Emc²/TAO API MAIL ENABLED APPLICATIONS:

The robust Emc²/TAO API provides a full set of subroutines that allow easy links to important line-of-business applications vital to your everyday business. Now your electronic mail system can easily exchange important data with any application. DDE allows for desktop integration and enables you to mail quickly and simply within applications like Word, Excel, and Pilot Lightship.

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# She SHALL OVERCOME

*Despite lower pay than men and slim hopes of becoming top managers, growing ranks of women are eagerly exploring growth paths in "IS . . . the most open of all professions."*

By Mitch Betts

Women in the information systems field are buffeted by salary discrimination, a glass ceiling and the stress of juggling work and family responsibilities. So the IS world is a pretty bleak place for women, right?

Wrong. *Computerworld*'s latest survey on job satisfaction finds women every bit as satisfied with their IS careers as men are. So everything is hunky-dory for women in IS, right?

Wrong again. The portrait of women that emerges from several recent studies of the IS work force is, like life itself, more complicated than that. Some women get so disenchanted they bail out for self-employment, some are on the "Mommy track" and some have broken through the glass ceiling.

"Every situation is different," says Elaine R. Bond, senior technology consultant and former senior vice president for systems at The Chase Manhattan Bank NA. Balancing the work load at home and at work is "very hard for most women, but some find a way to master it, and some find the pressure gets to be too much," says Bond, one of a handful of high-profile women in the IS world.

Clearly, generalizations on this topic are risky business. For example, defying all odds against women in male-dominated manufacturing industries, Mary Jo Burnes is the corporate director of IS at machine-tool company Cincinnati Milacron, Inc. And defying experts who say women refuse to relocate, Laraine Rodgers is an MIS director who moved to 19 cities in nine states while raising two children.

Alan Levenson

The city of Phoenix's Laraine Rodgers: *'I see lots of possibilities . . . and I keep going forward'*

### Higher job satisfaction

*Computerworld*'s most recent surveys on IS demographics, salaries and job satisfaction paint a rich portrait of just how women in the IS field are doing and who they are. The study reveals such statistical niceties as the fact that, on average, women in IS are college educated, politically liberal and late-thirtysomething; have been in the IS field 11 years; and read *People* magazine (see chart page 66).

More importantly, the research also points out many similarities between men and women in IS. For example, all are finding their jobs more stressful in today's harsh, "do more with less" business climate.

Still, when it comes to IS job satisfaction, women are actually happier with their work, according to the survey. Some 78% of the women polled say they are "satisfied," compared with 75% of their male counterparts.

Judging from those figures alone, you'd think IS departments must be fairly comfortable places for women to work. "IS is probably the most open of all professions because the focus is on technical skills, which are gender-blind," says Carol L. Covin, author of computer job guides for the Washington, D.C., and New England markets.

Indeed, *Computerworld*'s survey also confirms that both men and women believe IS offers an excellent career track. Further questioning, however, reveals that although women are eager for more "opportunities for advancement," they are only mildly optimistic that they will ever reach the executive level.

### Glass ceiling still exists

"IS is a very good career track for women. They can progress as easily as men can," says Kathleen V. Lennon, director of network management at Coastal Corp., a major energy producer in Houston. "But

Women in IS, *page 68*

# Women in IS

CONTINUED FROM PAGE 67

it's hard when you try to get to the very top."

Indeed, the studies confirm the existence of a glass ceiling that keeps women bunched up, statistically speaking, in the midlevel jobs in the IS department (such as database administrator) and sparsely represented in the executive suite.

If you rounded up 100 of the nation's top IS executives — chief information officers or vice presidents of IS — only seven would be women, according to *Computerworld*'s October 1992 survey of 1,383 IS professionals. The same survey shows that women make up about 18% of the IS work force overall.

Furthermore, *Computerworld*'s annual salary survey confirms the existence of a salary gap [CW, Sept. 7, 1992]. The average salary of women IS managers is 21% lower than the average salary for men, and the gap occurs even in the same job title. For example, women with the title of IS director make, on average, 18% less than men do.

These disparities occur even though men and women in IS rank evenly in the standard Morrow-Goetz test of "professionalism," according to a study by researchers Saroj Parasuraman, Magid Igbaria and Jeffrey H. Greenhaus at Drexel University in Philadelphia. The test rates 24 measures of professional involvement, such as systematically reading professional journals.

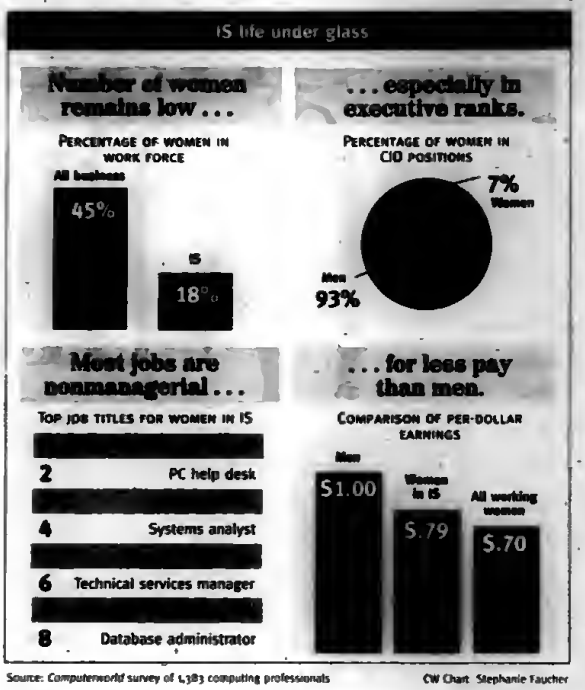
Part of the reason for the pay gap is that women did not enter the IS field in large numbers until the early 1980s, so they have not been in the field as long as men have or had time to move into higher paying management jobs, says Igbaria, professor of MIS at Drexel.

Yet there's another reason, according to the women interviewed for this article: old-fashioned discrimination.

### Mobility also an issue

"Women top out sooner than men, just below the CIO level. The CIO level reports to the chief financial officer or the chief executive officer, and that's still an old boys' club — the bastion of white men," says Beverly Lieberman, owner/manager of Halbrecht Lieberman Associates, Inc., an IS executive search firm based in Stamford, Conn.

Still another reason for the differences is that some women pass up the chance to take higher paying jobs because they choose not to relocate, says Shirley Bascom, owner/manager of the North Canton, Ohio, office of CompuSearch, a division of Management Recruiters International.




Source: *Computerworld* survey of 1,383 computing professionals — CW Chart: Stephanie Faucher

Bascom says she often presents career-boosting job opportunities to well-qualified women and is rebuffed. "I am frequently told that it would be very difficult for her to relocate because her husband's career is too important to get disrupted. That's a personal decision about priorities."

Of course, Rodgers, the 45-year-old MIS director for the city of Phoenix, is a definite exception. "I advanced because I'm a good package. I'm knowledgeable technically and businesswise, I'm articulate, I focus, I schmaltz — and I'm willing to relocate," Rodgers says.

Many experts say that, in addition to hard work and talent, the women who make it into the executive suite also benefit from a corporate culture that encourages the advancement of women.

Indeed, some of the well-known companies that have had female IS executives include Xerox Corp., Eastman Kodak Co. and Du Pont Co., which are ranked among the 100 best companies for working women, according to *Working Mother* magazine.

"The glass ceiling is a corporate culture issue," explains Mary Cirillo, formerly an IS director and now a managing director in the executive suite at Citicorp in New York. "Most advancement occurs due to raw achievement, but at the most senior levels of management, advancement also requires a level of comfort working with those [male] colleagues," she says.

Simply put, "the company has to foster an environment where the decision-making process does not exclude people because they can't go into the men's locker room after golf," Bascom says.

### Advancement for go-getters

The women who have climbed in corporations, Bascom says, "have been willing to travel a great deal, work very long hours and leave their children with other people. Sometimes they have extremely supportive spouses who modify their careers . . . and some of the female CIOs have never been married."

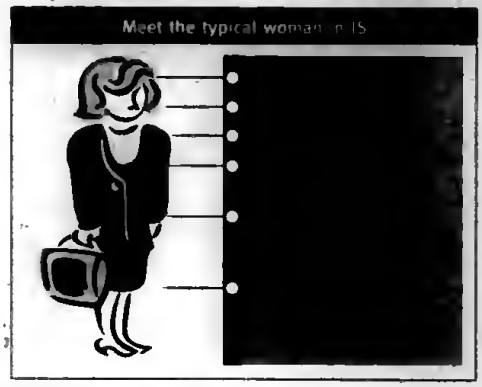
Some women reach the top while raising young children, while others become executives after their children are grown or do not have children.

Bond says women use a wide variety of techniques for balancing their work and family responsibilities.

Each woman has a different set of circumstances and tolerance for complexity and pressure, she says, so "I don't think there is a cookie-cutter solution to these issues."

As for her own rise to the top at Chase Manhattan, Bond says: "I didn't have the responsibility for children, and I think that makes a huge difference."

Women in IS, *page 70*




Source: *Computerworld* survey of 1,383 computing professionals

### Values of women at work

Pat Wallington, CIO of the U.S. marketing group at Xerox Corp., Rochester, N.Y.

"IS is a terrific field to be in because it gives you the opportunity to see the whole company and all of its different parts.

"I encourage people in my organization to go out and take a job in a business unit and then come back to IS. If you want to be an executive, do some zigging and zagging on your way up.

"The glass ceiling is certainly there, but sometimes it's overplayed. Men probably have just as many obstacles to making that major step from middle management to an executive role. Today's corporate downsizing trend really limits opportunities and creates a glass ceiling for everyone."

Isabella Castillo, MIS director at HCA Wesley Medical Center in Wichita, Kan.

"I got to my position when my son was a teen-ager. It would be very hard to be a director or vice president when you have younger children because of the long hours, sick kids, all of their school plays, sports and activities. I worked nearly 80 hours straight twice a couple of weeks ago — you couldn't do that with small children."

### Women learn to lead

Women are generally more than three years in the IS field, are very much [illegible] to be more supportive to [illegible] communities and the [illegible] development of women pulled [illegible] — including [illegible] — out of the [illegible] "very conservative."

[illegible] Women learn to lead [illegible] Thinking the [illegible] better [illegible] [illegible] [illegible]

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# Women in IS

CONTINUED FROM PAGE 68

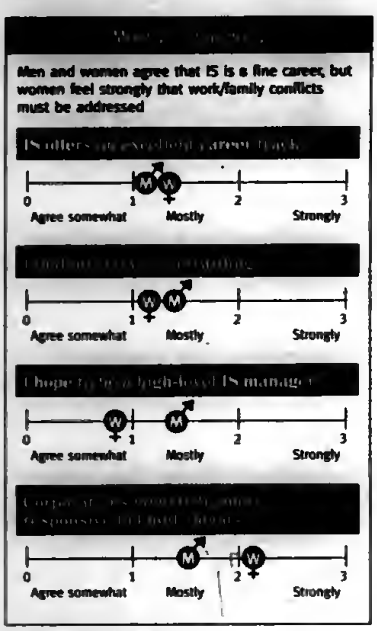
Drexel's study of 464 members of the Association for Computing Machinery found that the women were less likely to be married than the men, and the married women were less likely to have children.

"The large proportion of women professionals and managers who are single or divorced and have no children suggests these women attempt to minimize career/family conflicts either by not marrying or by remaining childless," the authors say.

Some women remain on a technical track or so-called "Mommy track" to accommodate their family needs rather than to pursue a management career, Igbaria says.

Others leave the corporate world to run their own small businesses and thus create their own corporate culture and accommodations for family life, according to experts.

"A lot of women have [left], and they will continue to do so until the [male] executives at large corporations retire and their successors turn the corporate culture around," Bascom says.


Men and women agree that IS is a fine career, but women feel strongly that work/family conflicts must be addressed



Source: *Computerworld* Database Division's IS demographics survey, October 1992

So the question remains: Why are so many women satisfied with their IS careers when they also face salary discrimination, a glass ceiling and work/family conflicts? The answer seems to be that job satisfaction entails more than money and promotions.

### More than money

"What really makes people satisfied at the end of the day is the gratification they get from day-to-day work, the completion of projects, the tangible results," Cirillo says.

Robert A. Zawacki, professor of management and international business at the University of Colorado in Colorado Springs, says his IS personnel studies show that "the biggest single motivator for both men and women is the work itself. You provide them with meaningful work, and they'll work too much."

The most encouraging finding of the Drexel study is that both men and women feel they have the opportunity to work on significant and challenging projects with competent colleagues, build a professional reputation and be respected by peers and management.

While it is clear from the demographics study that women want employers to adopt pro-family policies that make the work/family juggling act a bit easier, it also appears that "gender issues" have not put women into some sort of blue funk that distracts them from their IS work.

Or, as Rodgers put it: "I see lots of possibilities rather than obstacles, so I keep going forward." •

### Voices of women at work

Mary Jo Rosato, corporate director of IS at manufacturer Cincinnati Milacron, Inc.

"Our company is very, very conservative. There are very few high-ranking women — only two women (including me) at the director level. I'm very fortunate to have gotten this far to this company, and I attribute that to my skills. Also, I've grown up through the ranks with other mid- and senior-level managers.

"In my situation, the increased stress is due to the poor state of the economy, business conditions, downsizing, continual changes and the fact that we have to do more with less. I don't have any children. If somebody had children, they would be worse off."

A female IS manager at a California bank who asked to remain anonymous.

"I am reluctant to move someone into a super-critical position if I know she's planning to start a family because I know she'll be out for maternity leave, sick kids, etc. If I had two equally qualified people, I would choose the one I know would be available.

"There is no way women will ever get past that. We know the discrimination is wrong, but the reality is that we have a business to run. One of the reasons I do well is that I am past child-bearing age."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## Executive Track

Corporate redistricting at **ITT Hartford** in recent weeks has spun out information management as a separate department, which is headed by **John T. Crawford**, vice president and director of information management.

ITT's information management function was previously handled with operations, processing and planning, which was — and continues to be — headed by Senior Vice President **William L. Harrison**.

With Harrison's recent promotion to the additional role of president of the **ITT Specialty Risk Services** business of ITT subsidiary **Hartford Specialty Co.**, information management was given separate statehood.

Crawford, who formerly reported to Harrison, now reports directly to **Donald R. Frahm**, chairman and chief executive officer.

At **Norfolk Southern Corp.**'s Transportation Logistics Division, former accounting systems and administration director **Bruce L. Haddan** is settling into his new position as assistant vice president of systems. Haddan, who joined the Norfolk, Va.-based railroad company in 1975, is stationed in Fort Wayne, Ind.

**Edward A. Hopkins**, former vice president of IS at Blue Cross/Blue Shield of St. Louis, has taken his experience to the bank. Effective this past fall, Hopkins is now serving as an administrative officer at the Banking Supervision and Regulation Division of **The Federal Reserve Bank of St. Louis**.

Promotions recently announced by **Dollar Savings and Trust Co.** in Youngstown, Ohio, include that of **Jewell Klumpp** to the position of assistant vice president.

With her new title, Klumpp, who most recently served as senior vice president and secretary at **Potters Bank and Trust Co.** in East Liverpool, Ohio, assumes responsibility for Dollar Savings and Trust's wire transfer area and central information files. In addition, the bank named **Deborah Morgan** to the position of senior data processing officer.

**Have you, or a colleague in the information systems field, recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at 1-800-343-6474 to pass the news along.**

# Calendar

**FEB. 14 - FEB. 20**

**1993 Symposium on Applied Computing.** Indianapolis, Feb. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

**International Society for Hybrid Microelectronics (ISHM).** Advanced Technology Workshop: Advanced Materials, Processes and Interfaces. Ojai, Calif., Feb. 15-17 — Contact: ISHM/IEEE Workshop Registration, Reston, Va. (703) 471-0066.

**Western Communications Forum '93.** Phoenix, Feb. 15-17 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500

**Downsizing Expo.** Chicago, Feb. 16-18 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

**Mobile '93 Conference and Trade Show.** San Jose, Calif., Feb. 16-18 — Contact: Technologic Partners, Larkspur, Calif. (415) 924-1274.

**Adobe Technology Exchange Expo (ATXPO) Conference and Exhibition.** Santa Clara, Calif., Feb. 16-19 — Contact: ATXPO '93, Santa Clara, Calif. (408) 562-6104.

**Distribution/Computer Expo '93 West.** Anaheim, Calif., Feb. 17-18 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

**FEB. 21 - FEB. 27**

**SynOptics Users Group Conference.** Monterey, Calif., Feb. 21-24 — Contact: SynOptics Users Group, Santa Clara, Calif. (408) 988-2400.

**The Software Development Exhibition and Conference '93.** Santa Clara, Calif., Feb. 23-26 — Contact: Software Development Conference '93, Carrollton, Texas (214) 245-6012.

**1993 Government Imaging Conference and Exposition.** Bethesda, Md., Feb. 23-26 — Contact: USPDI, Inc., Silver Spring, Md. (301) 445-4405.

**Planning for Integrated Information Systems.** Orlando, Fla., Feb. 24-25 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1266.

**Seventh Annual Users Conference.** Salt Lake City, Feb. 24-26 — Contact: Wasatch Computer Technology, Salt Lake City, Utah (801) 575-8043.

**The 1993 Prepublishing Conference and Exhibition.** Feb. 24-27 — Contact: Graphics Arts Show Co., Reston, Va. (703) 264-7200

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# Integration Strategies: Enterprise Networks

**You are in the midst of a bunch of incompatible networks, trying to sort out conflicting protocols. You are aiming for nirvana — full and seamless exchange. It's confusing. It's intimidating. It's frustrating, but . . .**

# you'll survive

Sooner or later, it is going to happen to your company.

Management is going to discover the importance of close and continuous communications between functional areas that have never interacted before, such as sales and manufacturing or marketing and engineering. Or new business conditions will mandate an organizational shake-up that suddenly has a manufacturing plant in Germany and a distribution center in the Netherlands reporting to a product group manager in St. Louis. And you will have to figure out how to effect the necessary linkages among all the separate system enclaves.

If you're lucky, you'll only be trying to bring a couple of renegade proprietary systems and an ad-hoc local-area network or two into the companywide network. If not, you may have to cut over to an entirely new network architecture in order to achieve something open and fully tolerant of heterogeneity. Needless to say, the second route is an order of magnitude or so harder. But in no case should you expect a cakewalk. Throw out any vendor who promises you one.

Corey McCormick, senior network engineer at Citgo Petroleum Corp. in Tulsa, Okla., would know because he realizes just where the easy part stops.

"We've gotten as far as wire management, being able to tell if the physical wire is there," McCormick says. "But it pretty much stops below Level 4. Perhaps 10% to 20% of the tools we need are available but not across the different platforms."

Graham Morrison has also hit his share of ruts in his role as project leader on a 16-month network integration project for Blue Cross/Blue Shield of Connecticut. Take, for instance, the sticky little problem he's wrestling with right now — the inability of X Window System terminals to access file servers. Currently, he says, "we can only get access to big iron."

Eventually, though, if you watch your step, keep your head (and guard your wallet), you'll come through fine. The following stories — of adventures in progress — tell about some scrapes and missed opportunities, but they are all tales of survivors and offer some hard-won lessons about how to make similar trips with even less mishaps.

### Words to the wise

Here's a quick look at some of those points:

- Take small steps, and whenever possible, work with standards and technologies that have been around long enough to have their jagged edges smoothed. (55% of information systems shops surveyed by *Computerworld* say they'll be using Transmission Control Protocol/Internet Protocol for integration.)
- If business re-engineering is involved, don't get out ahead of that process.
- Don't rush and don't ignore warning signs to make deadlines. Problems are magnified when they occur in a live network.
- Build some bridges between network designers and application developers.
- Make sure you have enough of the right talent, either on-board or on-call, before you get started. Forty-nine percent of the respondents to the *Computerworld* survey say the biggest problem they have encountered is lack of in-house experience.
- Think long and hard about how you are going to divvy up administrative responsibility for the network and deal with the power issues that will crop up.
- Prepare yourself for the fact that, as soon as you finish one stage, the tools you needed to do it better and more easily will hit the market for a price you could afford. •

# Mobil net exec preaches patience

By Mark Mehler

**■ If there's one piece of advice that Ted Lumley would offer to anyone trying to create a networking infrastructure to support new business strategies, it's: Don't get ahead of the business re-engineering process.**

Lumley, chief of technical computing at Mobil Oil Corp.'s Exploration and Production Division in Fairfax, Va., has spent the past seven months implementing the first phase of what will be a major architectural revamping of Mobil's network. With only two months to go on this project, things seem to have gone pretty well, he says, but they could have been even smoother if the choreography had been better.

"There were times we were out in front of the business initiatives, and that can create antagonisms among the people who have to support [the infrastructure] who weren't yet conversant with the business strategy," Lumley says. "I'd advise anyone laying in new enabling infrastructure not to get there too early."

What's happening in Lumley's division is part of a gradual companywide transition to a standards-based network infrastructure capable of supporting a truly open exchange of information on a worldwide basis.

Mobil is not exactly coming out of the Dark Ages. The giant oil company has had a functioning multiprotocol global network supporting its technical activities and an IBM Systems Network Architecture (SNA) network on the commercial side. But there were gaps and breaks in the communications structure that reflected recently jettisoned functional divisions and prevented some kinds of information exchange.

For example, while the company had a proprietary electronic-mail system, users around the world could not easily access graphical applications or transparently exchange and share documents. Regional local-area networks had sprung up in great number and variety, separate from each

Mehler is a free-lance writer based in Jackson Heights, N.Y.

## Closeup

**Mobil Oil**

**Task:** Install a TCP/IP-based WAN backbone to unify departmental LANs standardized around Novell Unix servers.

**Purpose:** Create a worldwide standards-based network infrastructure to support new business plans.

other and from the network.

This group of technologies — Novell, Inc.'s LMX, Banyan Systems, Inc.'s operating systems, PCs and Unix boxes — did not fit with Mobil's plans for global operation and distributed open systems.

The answer: a gradual transition to conformity with an architectural blueprint completed in mid-1992. This consisted of a Transmission Control Protocol/Internet Protocol (TCP/IP)-based wide-area network backbone (moving to an Open Systems interconnect standard when that technology matures) tied into departmental LANs standardized around Novell Unix servers.

The initial nine-month implementation is expected to encompass about one-third of the exploration component of Lumley's division. The project is expected to be completed by the end of March. Mobil is spending approximately $5 million on this first leg, and a large chunk of that will be spent on retraining.

"The [networking initiative] has caused us to accelerate our PC upgrading," Lumley notes. "We've scrapped some 286 machines and brought in more 486s that can support the kind of networking applications we're doing. Along with the new Unix servers and desktop tools, our people have a big job getting up to speed."

## Inside


**More integration tales from:**

- **BASF. Page 76.**
- **NASA Ames Research Center. Page 76.**
- **Maytag. Page 81.**

**Plus: What you've wanted to know about network integration but were afraid to ask. Page 81.**


### WAN woes wither

The WAN issues, Lumley says, are pretty much resolved, with the existing technical corporate network integrated into the new TCP/IP Monet (Mobile Network), and the integration of Mobil's commercial SNA network is expected to occur somewhere down the line.

The biggest remaining near-term challenges, Lumley adds, are on the LAN side, not the least of which is coping with a glaring lack of standardization.

"It's a constantly moving target," he says. "Whenever Unix hits DOS, for example, we have a problem. We got an object-oriented GUI on the PCs provided by Hewlett-Packard [NewWave], but standards for information sharing aren't out yet. We had hoped they would have evolved more quickly. Right now, if a Unix user wants to get his hands on data generated in DOS, he's got to do a lot of manipulation."

Lumley laments the polarization between the Unix and PC communities. "The Unix [world] wants total abandonment of the PC, but we see Windows NT as something that is going to be an important consideration in our business, and we plan to [stay with both]," he says.

Similarly, Mobil has run up against the lack of standard policies and procedures for receipt of compound technical documents. Here, the Exploration and Production Division has been forced to undertake some internal development, a strategy at odds with its reliance on off-the-shelf products.

Still other problems include the lack of a robust Lotus Development Corp. Notes implementation in Unix and the absence of a native TCP/IP implementation by Novell.

"That is a major requirement," Lumley says. "Performance suffers when Novell has to use an IPX tunneling approach . . . but there are still lots of unknowns."

There are also some unresolved gray areas of how network management will be handled.

Mobil's centralized support organization will take on the difficult job of maintaining the high-level applications riding on top of the network, but beyond that lie a lot of unresolved questions.

"We're still working out all the details on which network components will be managed centrally and which should be distributed," Lumley says. •

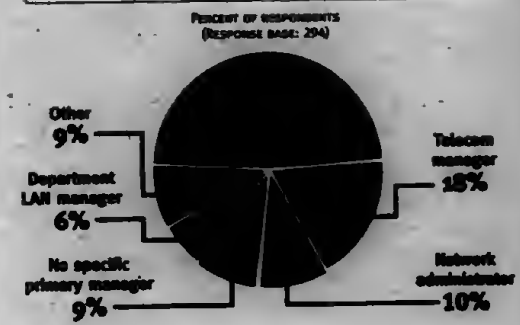
EXCLUSIVE CW SURVEY: NETWORK DECISIONS

## What IS professionals are saying

**A recent *Computerworld* survey of 294 IS organizations on network integration found 86% of them are running SNA**

Lack of in-house experience tops product incompatibility as the biggest problem for IS organizations when running multiprotocol networks.

The primary responsibility for managing enterprise networks is falling on IS managers




TCP/IP, the tried-and-true distributed network protocol, still dominates

Source: *Computerworld* Database Division

## Net Terms

**ATM: Asynchronous Transfer Mode. A gigabit-speed, scalable switched network. ATM is emerging to rival FDDI technology (see below) as a highway for aggregating traffic from lower speed networks.**

**FDDI: Fiber Distributed Data Interface. A 100M bit/sec. LAN most common now as a backbone for integrating traffic from multiple, lower speed LANs, such as 10M bit/sec. Ethernets.**

**Gateway: A device connecting two dissimilar communications networks by converting one type of protocol to another. For example, E-mail gateways allow various vendors' messaging systems to merge into an enterprise-wide mail system.**

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# Speed is the key at NASA Ames

By Alan Radding

**■ At NASA Ames Research Center in Mountain View, Calif., connecting high-powered workstations to remote supercomputers at very high speeds created special integration problems.**

The challenge was to connect scientists at dozens of remote sites through a backbone linking five major network hubs across the country at T3 speeds to permit efficient exchange of complex models and simulations.

A point-to-point bridged wide-area network had been in place since 1986, connecting research scientists at leading aerospace and defense firms with NASA Ames' supercomputers.

Although capable of speeds ranging from 56K bit/sec. to 1.344M bit/sec., the network was struggling to accommodate simulations that typically transfer 32M bytes of data in 10 minutes. NASA Ames' goal was to run interactive, real-time graphic simulations transferring 32G-byte files in less than one hour, says Eural Authement, network development manager.

NASA Ames began building a new network called AEROnet in 1989. The network was designed not only to accommodate escalating demand for greater bandwidth but also to improve the availability, security and management of the network. AEROnet, however, would push the limits of available network integration technology.

### Cost concerns

Ideally, the agency wanted to deploy T3 lines between its major hubs, but $6 million per year for a coast-to-coast T3 circuit in 1990 was prohibitive. Instead, the agency settled for four parallel T1 lines to create the equivalent of a T2 line at a cost of $1.2 million.

To squeeze the greatest performance out of the network, NASA Ames opted for routers rather than bridges. One key advantage, Authement says, is that routers can handle more than seven hops, making local-area network interconnections more feasible.

It didn't take long, however, for the agency to discover the outer limits of routers. For instance, it specified Open Shortest Path First (OSPF), a protocol that allows the network to respond to failures within three seconds rather than the 30 to 90 seconds required by conventional routing protocols.

OSPF promises to be an important protocol in building large networks that can quickly respond to failures, but now, OSPF is neither widely available nor as dependable as Authement would like.

The NASA Ames team did find two suppliers — Cisco Systems, Inc. and Wellfleet Communications, Inc. — with products that offered both OSPF and proprietary load-balancing schemes close to another protocol on its list. The agency had been looking for that protocol, called Equal Cost Multipath, so that it could balance loads across multiple circuits and "make four parallel T1 lines look like a T2."

So far, however, OSPF has been something of a disappointment. Authement complains that the protocol isn't efficient and is still in need of considerable tuning. For example, OSPF consumes a lot of CPU and router resources.

"We experienced CPU starvation on our routers," Authement says. This occurs because OSPF lacks a mechanism to establish priorities and, thus, performs CPU-intensive chores at times when NASA Ames wants it to send information packets instead.

The network team compensated for the problem by upgrading the router hardware, specifically dedicating a processor to protocol handling, installing a new release of OSPF software and tuning the router to ensure nothing bothered OSPF.

Another problem cropped up at the point where AEROnet touches the corporate networks of organizations accessing the supercomputers. NASA Ames used an approach called Exterior Gateway Protocol to create a boundary between AEROnet and the networks where the researchers reside.

"The nature of the protocol was such that it took 20 minutes to set up any changes," Authement says.

Today, there are other protocols, such as intermediate system to intermediate system (IS-IS), that promise to do the same thing faster, "but no one has really implemented IS-IS yet," Authement adds.

### Securing the premises

NASA Ames needed strict security at the boundaries between systems. Because each user on the system is involved in highly proprietary research, "we had to protect ourselves from the users and the users from each other." The agency implemented security at the routers using multiple filters which allow information from certain addresses to go to selected addresses and prevent users from going where they shouldn't.

Looking back, Authement says NASA Ames might have rushed things: "Our biggest mistake was deploying the network components too quickly." When AEROnet was one-third deployed, the staff noticed the OSPF instability, "but we continued to deploy it anyway," he acknowledges.

In hindsight, it would have been easier to solve the problem then, before it became a crisis later on. "We should have put time into the plan to stop and assess what was happening and solve problems," he concludes.

Having come in on budget, at about $4 million, for the first year of AEROnet, Authement's only real disappointment is in not having achieved his primary goal of T3 speed throughout the network. •

Radding is a free-lance writer based in Newton, Mass.

## Closeup

**NASA Ames Research Center**

**Task:** Link high-powered workstations to remote supercomputers at very high speeds and permit efficient exchange of complex models and simulations.

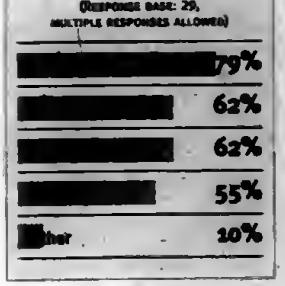
**Purpose:** Connect scientists at dozens of remote sites throughout the country and improve security and management of the network.

NASA Ames' Eural Authement *advises others to deploy networks slowly*

EXCLUSIVE CW SURVEY
NETWORK DECISIONS

Eighty-seven percent of the IS organizations surveyed have no plans to outsource any networking operations. However, the 10% that said they were likely to outsource some functions were mostly interested in assistance with integration.

PERCENT OF RESPONDENTS (RESPONSE BASE: 29, MULTIPLE RESPONSES ALLOWED)




Source: *Computerworld* Database Division

EXCLUSIVE CW SURVEY
NETWORK DECISIONS

PERCENT OF RESPONDENTS (RESPONSE BASE: 294)

While only 56% of IS organizations run more than one network management system . . .

| Number of management systems in use | Percent of respondents |
|---|---|
| [redacted] | 28% |
| [redacted] | 20% |
| [redacted] | 13% |
| [redacted] | 7% |
| [redacted] or more | 16% |
| [redacted]/Don't know | 16% |

. . . 84% said they want at least some degree of integrated network management in the following areas:

| | |
|---|---|
| [redacted] | 54% |
| LAN internetworks [redacted] operate management systems | 26% |
| LAN internetworks and [redacted]-only WANs in a single management system | 9% |
| LAN internetworks and [redacted] voice/data WANs in a single management system | 5% |
| [redacted]'t know | 15% |
| Other | 1% |

Source: *Computerworld* Database Division

# Two years, millions later

## Worldwide BASF makes compromises along the way

By Alan Radding

**■ In 1990, management at BASF Corp. in Parsippany, N.J., took a hard look at the company's network and saw something very close to chaos.**

"We had a mishmash of technology — islands of IBM, DEC and Novell," says Ameet Patel, who analyzes emerging technologies at the diversified, worldwide chemical manufacturer.

It is not uncommon for organizations to find themselves saddled with multiple, incompatible systems and protocols after years of ad hoc, incremental systems development.

And that's exactly what had happened at BASF, where individual departments built systems and local-area networks for specific tasks such as manufacturing, engineering and administration — around one or another proprietary technology.

What company management wanted and what the business demanded was a network that connected these various islands across 40 U.S. sites. Even more than that, BASF needed a running start toward an even more ambitious vision — distributed, integrated networks running client/server applications across the entire far-flung organization.

In 1990, the company could only integrate its Digital Equipment Corp. and Novell, Inc. LANs. "Systems Network Architecture [SNA] isn't routable, and there was no Advanced Peer-to-Peer-Networking then," Patel explains.

Global communications consisted of 800 employees using public electronic-mail services.

Clearly, getting to that ideal level of connectivity and information sharing was not going to be easy. In fact, it turned into a two-year, multimillion-dollar project involving not only the U.S. operations but also BASF's German headquarters and worldwide operations.

### SNA support

Today, the BASF integrated worldwide network is up and running along with a separate SNA network. The company has established anywhere-to-anywhere connectivity, integrating its various LANs into a network able to support open systems and client/server, Windows-based applications. In the U.S. alone, the BASF network currently embraces 40 sites, 600 servers and more than 6,600 workstations. A worldwide E-mail application on an X.25 network now supports 30,000 mail users.

The integration has been accomplished by Patel's 15-person team, which handles product evaluation, specification, creation and implementation.

The absence of standards in several key areas has made the job considerably tougher. With E-mail, for example, BASF selected X.400 as its worldwide standard but had to create its own directory service because the X.500 directory standard wasn't ready.

Constructing the directory service, using an Oracle Corp. database and an application written with Nantucket Corp.'s Clipper, required the efforts of three people for the equivalent of one man-year.

BASF also would have embraced Open Systems Interconnect if it were readily available. Instead, it turned to Transmission Control Protocol/Internet Protocol (TCP/IP) as its companywide integration protocol.

Using a variety of third-party and Novell add-in modules, it was able to add TCP/IP support to its Novell, IBM and DEC servers. It also introduced a new element, Hewlett-Packard Co., Sun Microsystems, Inc. and IBM Unix servers, into its network.

Accommodating diversity was an absolute necessity because the company wasn't about to replace the existing IBM, DEC and Novell networks. But the need to be this ecumenical forced the company to move closer to the technology edge than would normally feel comfortable. For example, they had no choice but to use multiprotocol routers, which were still a relatively immature technology.

Patel and the manager of the technical services group evaluated all products against a matrix of features and spent three months viewing vendor demonstrations. But the team didn't bother with any pilot projects because BASF already had a similar network running in Germany. However, Patel says, "If I had to do it again, I'd probably use pilots and prototypes. You can't really tell how routers behave in a lab. You have to grow the networks."

The proliferation of protocols created another crisis: a memory crunch on the users' PCs.

With DOS and protocol stacks for IPX and TCP/IP, memory was very tight. This led to widespread debate among the group over whether and how to load all the necessary protocol stacks into the users' DOS workstations. "We wrote what seemed to be a Ph.D. thesis on memory management," Patel says.

One rough patch for the team was devising access paths across different databases, including Oracle and DB2.

"It was difficult trying to get Oracle and DB2 to talk to each other. There were plenty of gateways, but every vendor does it differently," Patel says.

The team wrestled with creating various front and back ends to connect users and applications to different databases. "We could have used some standard application programming interfaces like [Microsoft Corp.'s Open Database Connectivity]," he explains.

Such interfaces promise to smooth the connection between any front and back end.

### Missing management

Probably the biggest cloud, however, was one that still lingers — lack of robust network management. Although there are many more products available now than there were two years ago and BASF has adopted several Simple Network Management Protocol tools, Patel remains wary.

"I have warned our vendors that they must provide management as good as or better than we had on the mainframe," he says.

And that's the next giant step: applications or, more specifically, re-engineering applications to take advantage of the network. "We believe in the model of one integrated system where, say, a salesperson or manager anywhere in the world can get on the network and see what is being produced, what's been shipped or what's going on with a particular customer."

Reworking applications to permit that is no snap, Patel says. "It's a steep learning curve and a process that can take years." •

**BASF's Ameet Patel:** *'We had a mishmash of technology'*

## Closeup

**BASF**

**Task:** Integrate various LANs into a worldwide network that can support open systems and client/server, Windows-based applications.

**Purpose:** Connect various departments across 40 U.S. sites; improve global E-mail communications.

## Wish List

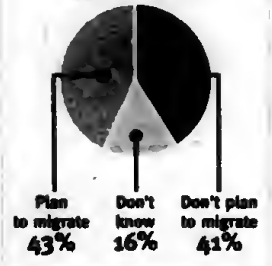
IS managers have a number of technologies and procedures that need refining to help ease the challenge of large-scale network integration:

- **Directory standards such as X.500 for E-mail directory services.**
- **Database access standards such as Microsoft's Open Database Connectivity Interface, which promises to smooth the connection between any database front and and back end.**
- **Open Shortest Path First. When interconnecting LANs and WANs, this is an industry-standard way for a router to choose the shortest, most economical communications path from among several going to the same destination.**
- **Equal Cost Multipath protocol. This would allow balanced loads across circuits.**

### EXCLUSIVE CW SURVEY NETWORK DECISIONS

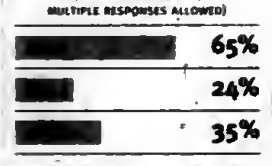
IS organizations surveyed are split evenly on their plans to migrate to a peer-to-peer network scheme

PERCENT OF RESPONDENTS (RESPONSE BASE: 104)




LU6.2 is the most popular protocol managers are using or planning to adapt in the next 12 months

PERCENT OF RESPONDENTS (RESPONSE BASE: 104, MULTIPLE RESPONSES ALLOWED)

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Current RDBMS (Check one):

- ❑ ALLBASE
- ❑ DB2
- ❑ Informix
- ❑ Ingres
- ❑ Microsoft SQL Server
- ❑ Oracle
- ❑ SQLBase
- ❑ Sybase SQL Server
- ❑ XDB
- ❑ Other: _____

I plan to use: _____

Current GUI (Check one):

- ❑ MAC
- ❑ Presentation Manager
- ❑ NextStep
- ❑ Other: _____
- ❑ UNIX/MOTIF
- ❑ UNIX/Open Look
- ❑ Windows 3.0/3.1

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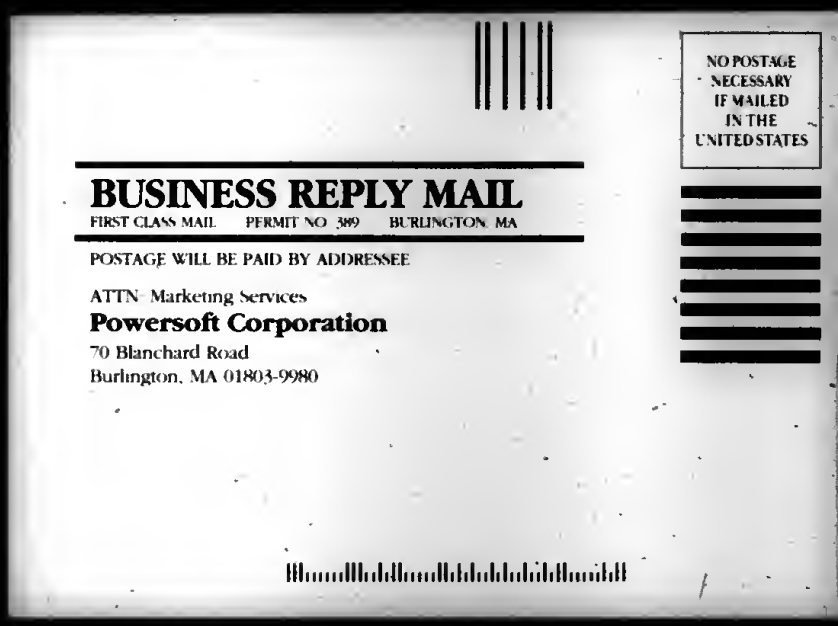

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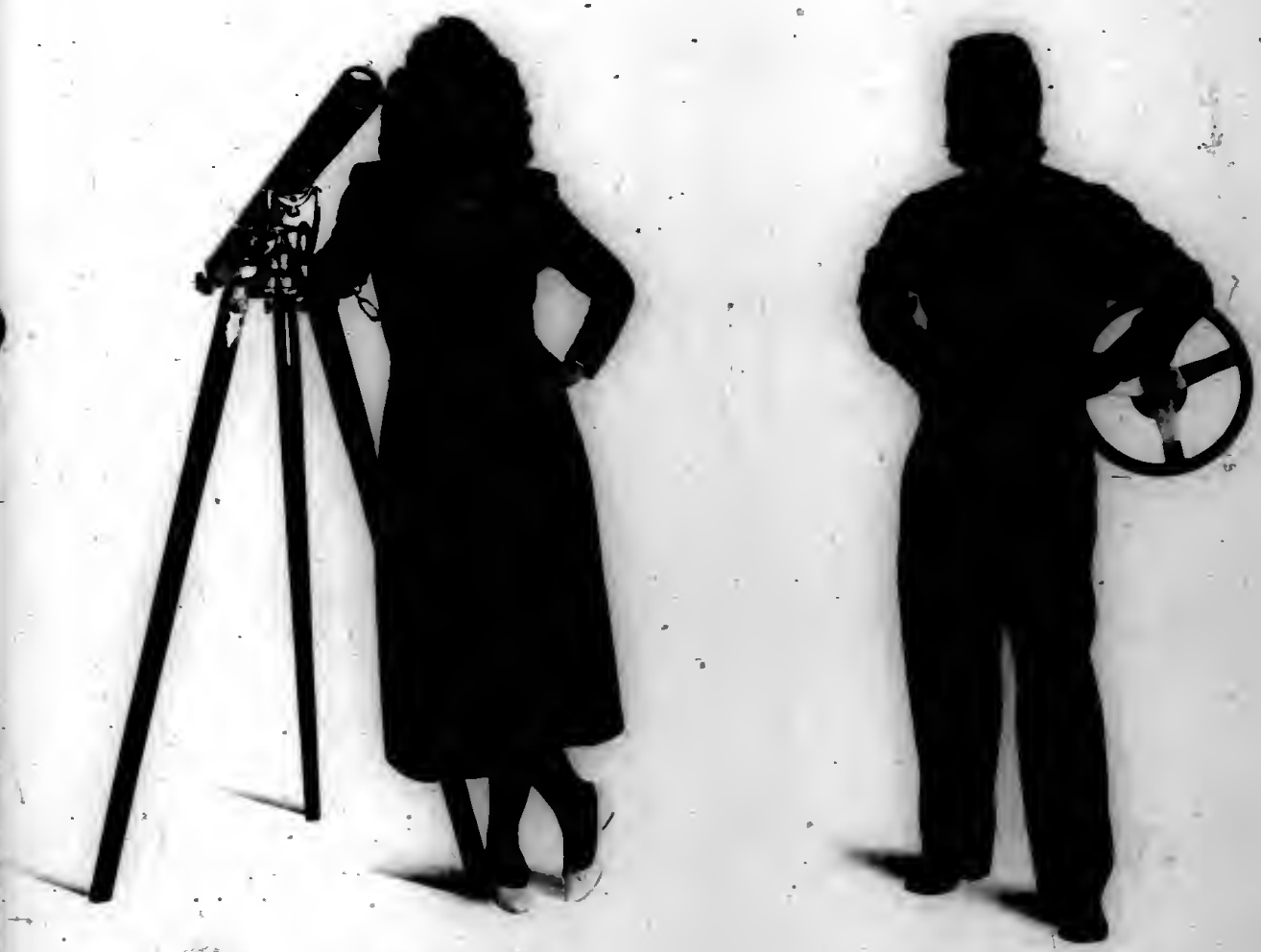

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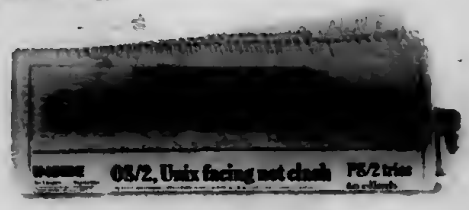


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Advice

# Integration in YOUR terms

*Thomas Wm. Madron answers some common questions that frequently trouble users attempting large-scale network integration:*

**Why do products purchased from integrators cost so much more than those purchased through mail order?**
Although the answer to this question may seem obvious, customers often will not recognize that the profit made by an integrator is a combination of product sales and consulting services. Frequently, the higher profit margin is from the sale of products rather than the sale of services.

When someone purchases through an integrator, at least some services will flow from that purchase, whereas a purchase of hardware and software by mail order (or from the corner computer store) carries no implied services with it. The integrator should add value to the products purchased in some fashion or another, but a customer should not expect to obtain only the added value without the product purchase.

**Can I make do with a peer-to-peer local-area network rather than investing in one that requires an expensive server?**
The answer to this question is not clear-cut. Peer-to-peer LANs are now being sold with the argument that they are much less expensive than server-based LANs, and sometimes that is true. In a small group setting, peer-to-peer LANs can be perfectly adequate. Unfortunately, it is usually difficult to get an integrator to sell and install such a LAN, so it frequently becomes a do-it-yourself project, whether that was the plan or not.

There are several reasons why integrators are reluctant to deal with peer-to-peer LANs. These include low profit margins, technical conservatism, unfamiliarity with the peer-to-peer products and some genuine technical drawbacks.

Probably the most frequent cause of distress with peer-to-peer LANs is the fact that while there may be no dedicated servers, there are shared server mechanisms whereby resources on the workstations are shared by all the members of the workgroup. This means that if someone turns off his machine during a coffee break or at the end of the day, the server functions of the machine will no longer be available.

Moreover, if one user is performing a resource-intensive chore, everyone on the network may have to put up with less than satisfactory network performance.

**Answers to some questions your network integrator and/or product vendors may not want to answer.**

**Why would I want to use a peer-to-peer LAN "on top of" my company's large server-based LAN?**
Peer-to-peer network operating system vendors such as Artisoft, Inc. (LANtastic), Novell, Inc. (Novell Lite) and Microsoft Corp. (Windows for Workgroups) frequently stress that their products are Novell NetWare 3.X-compatible. One good reason for using one of these peer-to-peer network operating systems along with NetWare 3.X is to further integrate specific workgroups.

Sometimes a workgroup will have specialized equipment, such as a plotter, that is used heavily by several group members but not used at all by others. In such an instance, the peer-to-peer network operating system will be using the same wiring, network interface cards and workstations used by the corporate LAN.

**Do I have to acquire leased lines or network services from an X.25 or Transmission Control Protocol/Internet Protocol network vendor to integrate my central and remote offices?**
There is no single, straightforward answer to this question. One of the variables is the extent of connectivity required. If there is a high load passing from one remote site to another, it may be that the services from a network vendor or even leased lines will prove to be cost-effective. In many cases, dial access will provide equal service at considerably lower costs than the more traditional approaches.

In most small and medium-size businesses, the actual amount of on-line use between remote and central sites is minimal, thus not requiring 24-hour-per-day, 7-day-per-week service. I have one client that estimates it can reduce communications costs to remote offices from about $120,000 per year to less than $50,000 per year by using dial access. At the same time, the client will be able to improve and expand the services offered. Part of what makes this possible are newer, higher speed modem technologies.

The newer dial-up, low-cost modems include data compression and error-correction protocols that allow data transmission over voice-grade lines with fewer problems. •

Madron is the author of several networking books, including *Peer-to-Peer Networks* (John Wiley & Sons, Inc., 1993). He is also the president of a Dayton, N.J.-based networking consultancy.

# Maytag: No more lonely employees

**Closeup**
**Maytag**

**Task:** Downsize from mainframes to mostly IBM AS/400s and link several divisions via a wide-area Token Ring network.

**Purpose:** Improve the communications flow among its nine domestic divisions.

By Mark Mehler

**■ Maytag Corp. is using downsizing as an occasion for improving communications flow among its operations. As part of a move from a mainframe-centric setup to one in which IBM Application System/400s play the lead role, the Newton, Iowa-based appliance manufacturer is attempting to link its nine domestic divisions via a wide-area Token Ring.**

Howard Buck, Maytag's network operations analyst, has begun implementing the new network and expects to have approximately 15 remote locations integrated into the wide-area network by mid-1994. Making the task somewhat easier, he notes, is the fact that 80% of the existing local-area network midrange traffic is IBM's Systems Network Architecture (SNA), while NetBIOS dominates on the PC side.

"We wanted to get rid of the big iron, and the alternative to [putting SNA on Token Ring] was a traditional APPN connected with an SDLC-type of line, which would have added a great deal of complexity," Buck says.

A few complications may be unavoidable. A number of divisions have yet to make their final platform decisions, and Buck says he foresees some integration headaches as local requirements begin to introduce diversity into his monochromatic network scheme.

"We haven't yet faced a lot of protocol issues," he says, "but there may be some situations where the AS/400 can't pick up the engineering load, and we would need to integrate DEC platforms, say, into Token Ring."

Maytag's Howard Buck: *'We wanted to get rid of the big iron'*

But the biggest potential problems by far, Buck says, relate to the management of the network. The network currently has eight servers and about 1,000 workstations. Buck estimates that by the end of this year, Maytag will add three or four more servers and 500 to 700 workstations.

In this case, it isn't the technical issues that have Buck worried but the prospect of political wrangling among Maytag's autonomous divisions.

To be sure, Buck would love to see an integrated set of network management tools that would be compatible with existing platforms and allow monitoring from one station, but he says he can get by with the tools he has. Besides, unless the divisions agree to cooperate, central management won't work. Right now, each division has its own information systems staff and some may want to maintain dominion over distributed computing.

Rather than trying to seize control, Buck has concentrated on diplomacy. "What we did to soothe their concerns was to examine all the commonalities across the divisions and publish a standard package identifying different protocols and platforms and setting up address guidelines," Buck explains.

This standards package has been helpful in establishing naming conventions that eliminate duplication and simplify administration.

Buck's group is also working with the divisions to pinpoint responsibility, enabling each IS group to begin staffing and training key personnel.

"It's a daunting challenge for the divisions," he says, "which a couple of years ago were dealing with a bunch of dumb terminals and are now faced with intelligent workstations and a slew of networking problems." •

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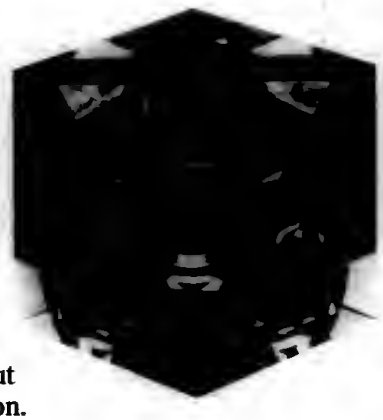

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# interesting developments

*Do you want a snazzy GUI?*

*Interested in some quick prototyping?*

*Does building across platforms turn you on?*

## Client/server development tools are not all created equal

Wes Hayakawa

By David Baum

Say "client/server application development" out loud. Just try it. Then quickly look around at your information systems staff. Watch as their eyes bug out, their faces turn bright red and they run screaming from the room.

Not an encouraging response. But you can avoid the fear and loathing that comes from development tools that don't do the job. Make your life easier by doing some up-front work: Educate yourself on the types of tools available and what they're good for. You'll save yourself and your development crew a lot of pain.

Baum is a free-lance technology writer in Santa Barbara, Calif., who specializes in application development issues.

Most application development products fall into two categories:

- **"Bottom-up" or homogeneous products.** These visually oriented tools are designed for PCs, favoring quick development of in-house applications over data modeling.

A sampling of tools includes Microsoft Corp.'s Visual Basic, Borland International, Inc.'s ObjectVision, Powersoft Corp.'s PowerBuilder, Easel Corp.'s Easel Workbench, Gupta Technologies, Inc.'s SQL Windows and Matesys Corp.'s ObjectView.

- **"Top-down" or heterogeneous products.** Designed for larger systems and multiple hardware environments, top-down products begin with an analysis of system requirements, leading to the design of a logical data model.

Top-down tools consist of high-end workbenches for writing complex applications. Examples include Uniface Corp.'s Uniface, The ASK Group, Inc.'s Ingres/Windows4GL, Oracle Corp.'s SQL*Forms, Miles Burke Associates' Procept application generator and SmartStar Corp.'s SmartStar Vision.

There is a place for both bottom-up and top-down types of products at most firms, depending on need.

### Glitzy, glittery GUIs

If your plans call for building a graphical user interface, your best bet is a bottom-up tool. These tools have many features for window creation and object management. Their strength lies in developing client applications that maximize the use of windowing operating environments such as Microsoft's Windows.

These PC tool sets support features such as dynamic Object Linking and Embedding (OLE), making it possible for users to invoke one application within another and to create hot links among the data. Many of these products also offer multimedia capabilities.

Visual Basic and ObjectVision, for instance, are geared to build MS-DOS and Windows applications quickly. Developers draw the user interface and attach code that responds to events in the GUI. Features such as rapid form designers and tool kits of commonly used window components make developers productive quickly.

Sun Hydraulics Corp. in Sarasota, Fla., uses Visual Basic for its user interface-intensive jobs, says Chris Barlow, a software engineer at the company. "We have used it to create very sophisticated front ends for our order entry and order processing applications."

Developers at Sun Hydraulics have involved casual users in the development process, turning them loose on screen design and basic GUI logic. By setting up Dynamic Link Libraries (DLLs, or libraries of preprogrammed functions users can link to) for more complex functions, such as network connectivity and database indexing, they can shield users from these more technical aspects of development. Visual Basic users can choose add-on components, quickly attaching them to new applications in the form of DLLs.

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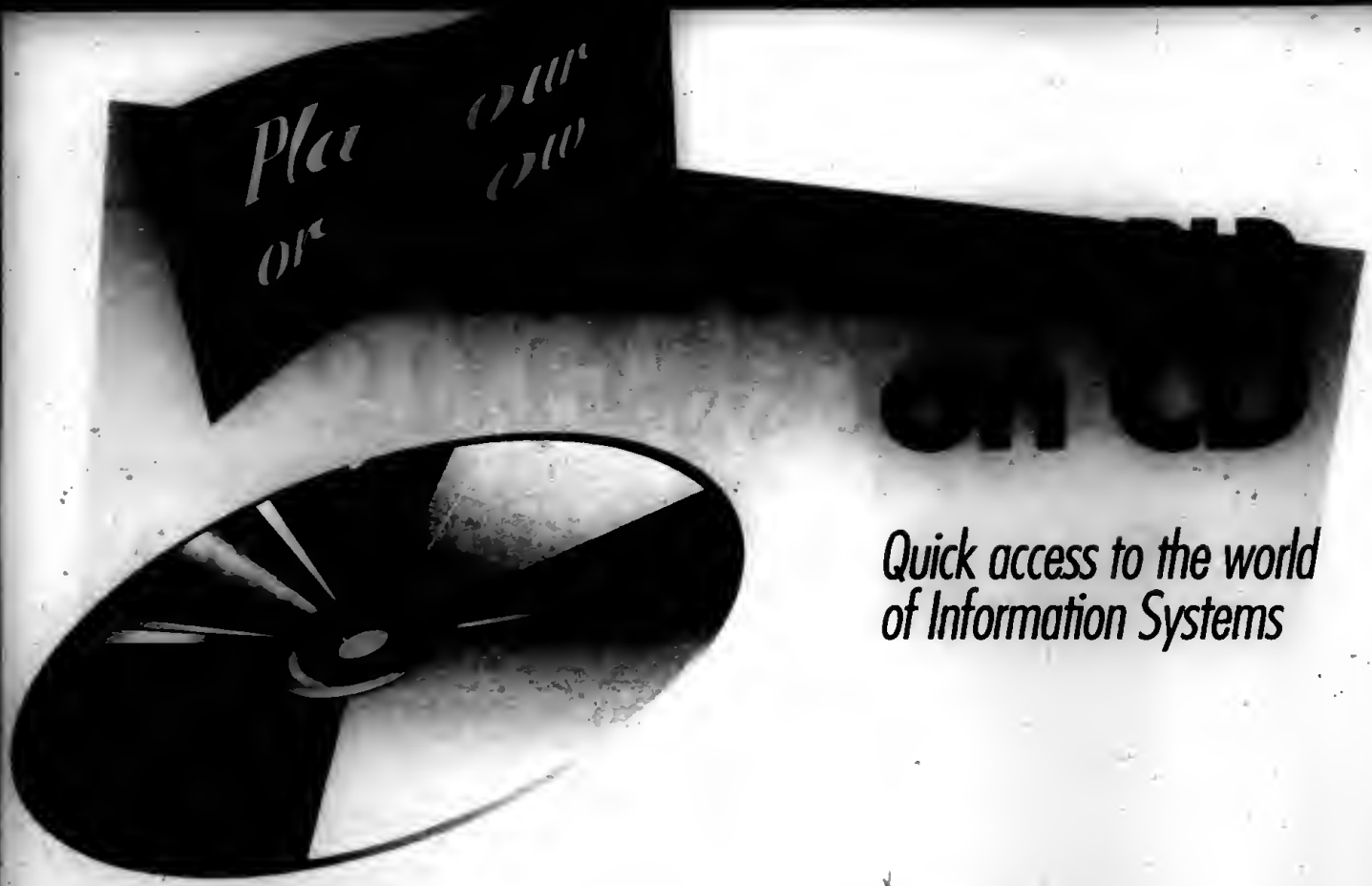

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# Client/server tools

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"In three minutes t can create a full-blown, text-editing window with mouse control, buttons, save functioos, etc.," Barlow says.

### Ode to the code

You build tt fast, users tove it and it gets the job done. What etse is there?

"The GUI has the glitz and glitter and thus tends to garner the lion's share of attention," says Jodith Hurwitz, fouoder of the Hurwitz Consulting Group in Newton, Mass. "But some of the [bottom-up] tools tack depth" for groups that oeed to create complex SQL database management system applicatioos in beterogeoeous eovironments and to build applications from an enterprisewide data model.

In terms of building database and database connections, bottom-up products automate the creation of the user interface but force you to write code for database transactions. This is not a problem in a simple application that accesses a few database tables, but it can get extremely time-consuming for more complex retatiooal applications that might involve 50 or t00 tables with numerous joins among them.

"Unless you have tried it, you can't appreciate the effort required to create applications that include both graphical user interfaces and SQL database processing," says Ralph Dunlap, project manager at Georgia-Pacific Corp. in Atlanta. "Just to create a simple invoice applicatioo that allows for a ooe-to-many retationship with standard SQL operations, even with a GUI builder, is a three-week programming task."

SQL grew up oo mainframe and minicomputers, but today it is intreasingly being implemented in client/server networks as a way of enabling PCs to access the resources of corporate databases. SQL can be used with a wide variety of DBMS packages.

Developmeot tools differ widely in their implementations of SQL. For example, Visual Basic queries are coded in Basic; a translator turns queries into SQL for processing by an SQL database server, such as Microsoft/Sybase's SQL Server. Many bottom-up tools, such as Visual Basic, have no knowledge of back-end server activities.

In cootrast, a top-down product such as SmartStar Vision oses SQL as the foundation for all development activities, from data modeling to reporting. This enables more sophistication when it comes to client/server database processing. It can query multiple, heterogeneous database tables within a single transactioo without requiring any coding.

Often referred to as client/server development environmeots, many of the bottom-up tools are in fact client-only products. They run oo a client PC and connect to a client/server database through low-level gateways. These products provide access to SQL databases but don't allow any SQL processing as part of the application. They rely on third-party database servers to process SQL queries, so they are best suited for applications that don't have intense relational database processing requirements.

### Still need to code

Both Borland and Microsoft have announced plans for database dictionaries based on the specifications of the SQL Access Group, a consortium of database vendors. These dictionaries define application programming interfaces to make it easier for developers to interface applications with various databases. But developers must still code the transactions in the application.

By contrast, newer, top-down products such as SmartStar Vision integrate complete SQL transaction models within the development environment. This makes it easier to create applications because developers don't have to code database transactions. Such tools have payoffs in terms of maintenance as well.

Keith Therrien, senior architect at Arkwright Insurance Co. in Waltham, Mass., says integrating SQL transaction models within the environment has benefits in terms of flexibility.

"Consider, for example, an application that has been created to process customer claims through a GUI window or character cell form," Therrien says. "In most bottom-up eviron-

Client/server tools, *page 86*

## Utility firm wants to beat productivity blues

WHAT DO YOU DO when your management demands a tenfold increase in application development productivity? For Todd Powell, senior systems analyst at TransAlta Utilities Corp. in Calgary, Alberta, it was precisely such a request that started him thinking about new approaches to software development.

TransAlta relies on a cluster of six mainframe DEC VAX 8000 computers as the hub of its widespread information network. Not so long ago, these computers supported TransAlta's work force of 70 remote locations in a time-sharing environment of character mode terminals. But as more desktop computers began popping up, TransAlta decided to turn to client/server applications.

Most bottom-up development products generate C or Basic code for the GUI shell, but developers have to customize it manually. But the work doesn't stop there. For a client/server environment, once the user interface is in place, developers must connect it to the database and create database access logic.

"This takes an awful lot of coding — often very complex coding," says Powell, who had been working with a bottom-up tool. "Even simple things that you probably take for granted if you have used a fourth-generation language, such as edit masks for a field, have to be programmed manually."

To reach their goal of increasing productivity, Powell and his colleagues become a beta-test site for SmartStar's SmartStar Vision, a top-down, object-oriented application development environment.

Instead of just creating GUI objects and positioning them on-screen, developers could control the behavior of these objects without coding. They could tie database operations such as read and write updates to the fields.

Coders could manually associate fields with a database column or automatically import them from a database table. Fields could be represented by a wide variety of objects, such as text fields, label fields, scroll fields, radio fields, list fields, buttons, scroll boxes and menu bars.

Powell and others are developing an industrial customer billing system that includes dozens of variables and rate options. Users work with pull-down menus, push buttons and uniform colors to get the information they need, making use of a mix of intelligent desktop devices and character mode terminals based on the Open Software Foundation's Motif.

Powell acknowledges that productivity increases have not been as dramatic as expected because it's taken time for developers to become proficient with the environment. But he says the goal of tenfold improvement is in sight.

"We're witnessing a departure from the time-sharing mode of large, centralized computers as workhorse machines," Powell says. "Developers can now take advantage of the CPU capacity of the client as well as the capacity of the server. They can build applications quickly. Even then, they gain an understanding of object-oriented techniques, a whole new world of possibilities opens up."

# Client/server tools

CONTINUED FROM PAGE 85

ments, the capabilities of that window are fixed. If a user says, 'I only want to retrieve records from the state of Massachusetts,' then the application has to be recoded to deal with that one situation."

But top-down products handle this type of query qualification through querying shortcuts known as "wild cards," Therrien says. "Developers don't have to foresee all that complexity. It is built into the transaction model."

Arkwright uses a top-down development tool because it fits best with its heterogeneous information architecture. Developers can use Digital Equipment Corp.'s Ultrix, Unix, DEC's VAX/VMS and, eventually, Microsoft's Windows NT to develop applications.

"You don't even have to recompile a SmartStar Vision application to move it from one environment to the next," Therrien says. "You just copy it over with the database attached, and it will run unchanged."

Cross-platform development is a key distinguishing factor between top-down and bottom-up tools. Top-down provides for it, while bottom-up doesn't.

Top-down tool Uniface, for instance, enables users to mix and match hardware platforms, DBMSs, GUIs and networks, nearly eliminating the need for redeveloping applications. It lets developers create large, distributed relational applications.

Developers at software firm Encompass in Cary, N.C., are using Uniface to

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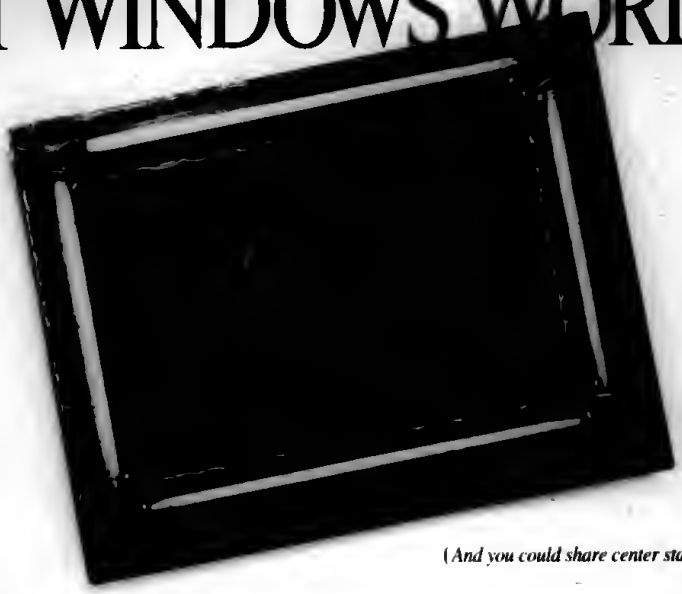

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# Client/server tools

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create a logistics management system. The system's aim is to help firms with global shipping requirements establish electronic links with trading partners and service suppliers.

Users won't need to be concerned about the networking protocols, database engines or operating systems, instead accessing Encompass applications through the native modes of their desktop systems, right along with the applications on their local-area network.

Uniface's Universal Presentation Interface enables applications to be deployed on multiple platforms running Windows, the Open Software Foundation's Motif, OpenLook, IBM's OS/2 Presentation Manager and character mode systems simultaneously.

But products such as Uniface aren't right for firms that want to throw applications together fast, says Ken Blood, vice president of development at Satellite Computing, Inc., a value-added software reseller in Virginia Beach, Va. "It may be overkill for simple applications."

**The case for CASE**

Many developers look for products that enable working from a data model for mission-critical systems, in which all objects and attributes have been carefully defined.

Top-down products, such as the Procept application generator, provide connections to front-end computer-aided software engineering (CASE) tools, enabling business requirement analysis before developers build any application objects. Developers can automatically import the data modeling information into a logical repository, from which they can construct specific applications.

Procept's enterprise model defines all objects and attributes, providing a framework of application "assets" that can be tailored to fit business needs. Developers map business requirements onto the existing asset base rather than developing application-specific objects and programs for each requirement.

Some bottom-up products, such as Powersoft's PowerBuilder, can make use of a logical data model as the foundation for applications, but developers must type in the data definitions by hand. Products with connections to front-end CASE tools, on the other hand, can populate a repository with information for a previously defined data model.

**Assessing your needs**

The bottom line is that the low-cost ($100 to $1,000), fast development cycle and short learning curve of bottom-up tools make them worthwhile for corporate developers working in homogeneous environments of PCs and PC LANs, where Xbase database products (such as Fox Software, Inc.'s FoxPro and Borland's Paradox and dBase) abound.

Bottom-up tools create GUIs, work well with third-generation languages and offer sophisticated program-to-program interfacing. As corporate IS departments downsize to PC networks, these homogeneous development tools become more and more attractive.

For their part, top-down tools are expensive ($2,000 to $200,000) and have a steep learning curve. They can't provide developers with the level of sophisticated graphical environment a bottom-up tool can, nor do they take full advantage of the powerful PC operating environments for activities such as OLE.

Their strength lies in cross-platform development. Also, top-down tools contain internal SQL engines, front-end CASE tool support and the ability to do heterogeneous database processing. •


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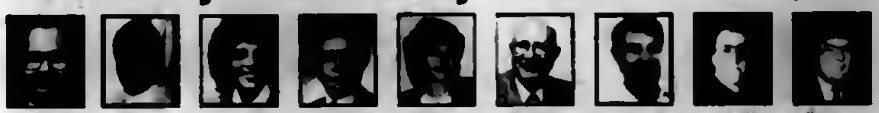

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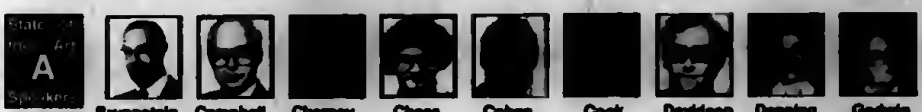

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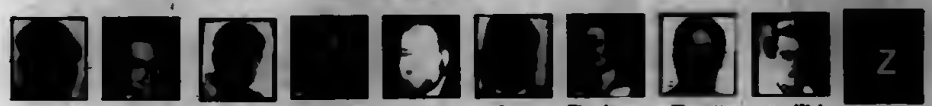

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# Computer Careers

## How to get that needed PC experience

By Kelly E. Sewell

MAINFRAMERS WANTING TO make the move into the PC arena are faced with a scenario that college seniors know all too well — nobody wants to hire them without experience, yet they can't get experience if nobody will hire them.

"No matter what I do, it isn't right," says Greg Ritsul, a Bridgeport, Conn., mainframe programmer/analyst trying to move into the Novell, inc. networking arena. "I feel like a leper."

If you continually find yourself running into walls, recruiters and former mainframers who have been successful in making the switch suggest you try a different approach.

### Self motivation

Wayne Robinson, manager of software systems at Prudential investment Corp. in Newark, N.J., used to be a mainframer. "I got some books, put together an environment and taught myself [PC skills]," he recalls. Soon after, there was a reorganization, and he ended up in the group that did PC and local-area network work.

Not everyone can be lucky enough to be in the right place at the right time, however.

**Bridging the mainframe-to-PC gap**

- Lead the efforts at your company to consider PCs as an alternative.
- Get involved in PC projects. Look for opportunities to learn skills gradually on the job.
- Focus on acquiring skills in technologies such as open systems, client/server, Unix, fourth-generation languages, relational databases, C, C++ and RPG III.
- Demonstrate your ability to learn. Teach yourself PC skills. Learn less common PC skills such as C and C++.

Stanley Durbas, president of Data Careers in Middletown, Conn., says mainframers should try to get involved in PC projects at their current company. "The people I know who have successfully gone from mainframes to PCs have been in departments where they could do it," he explains.

If you're not in a company that's making the transition, find one that is by looking through the papers and identifying firms that have had PC openings in the past, he says.

One problem mainframers encounter is that their PC skills are often self-taught.

Many potential employers don't take this experience seriously because it wasn't acquired through formal channels and was probably learned on DOS using common software, notes Shirley Bascom, owner/manager at the North Canton, Ohio, office of CompuSearch, a division of Management Recruiters International.

"Those skills aren't all that valuable," Bascom says.

Durbas agrees. He says if learning on your own is your only option, choose what you teach yourself wisely.

According to Bascom, companies are moving to open systems with client/server setups and Unix systems. Additionally, they want people who know fourth-generation languages.

Recruiters and mainframers have found that the catch-22 is intensified by the fact that many colleges aren't yet offering courses in newer technologies. Bascom suggests that if you can't find a school with courses in such areas as relational databases, Unix, C and RPG III, put pressure on your local community college and get them added to the curriculum.

Additionally, she says, be instrumental in having your company evaluate alternatives to mainframes. "You can benefit your company by showing it ways it can save money," she says. The payoff will be that you'll be able to bring yourself up to speed in the newer areas.

"I was consulting two people last summer who wanted to know if they should learn Lotus' 1-2-3," Durbas says. "I told them, 'Everybody and their brother knows that'" and recommended they learn C, C++ and Paradox. Both now work in jobs using C and C++, he says.

And if potential employers turn you away because you gained that experience on your own, you probably don't want to work there anyway.

### Dedication should count

"Managers should be saying, 'This person has taken time out of his personal life and has shown a dedication to it and an interest in it,'" Durbas says. If you have good mainframe skills, managers should recognize that they can be transferred to a PC environment.

Ritsul, who has yet to use his Novell training, wishes that was the case with him.

"I figured since I've been in the business for eight years it would count for something," he says. "I'm confused. Problem-solving in a data processing environment is problem-solving in a data processing environment."

Robinson concurs. "Some of the implementations are different, some of the vocabulary is different, but you've still got boxes and pipes and something doing something to data and producing something. It has much more in common than is different."

Sewell is assistant editor, features.


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Industry currents

# Construction opportunities are building up

By Emily Leinfuss

WHILE THE CONSTRUCTION industry has been hard hit by the weak economy, it may actually turn out to be a promising market for IS professionals in a few years.

The combination of the projected upturn in the economy, with the advent of networking and the development of electronic data interchange (EDI) standards for the industry, give information systems career prospects a boost in the long term, says Joe Winston, corporate director of IS at Gilbane Building Co. in Providence, R.I.

Winston says EDI will be useful because it will allow construction companies to communicate with clients or customers for cost schedule data and with architects and consulting engineers for contract drawings and specifications.

### Leaders of the pack

Construction companies that are wise to the uses of information technology are pulling ahead of the pack. In fact, there are pockets of IS opportunities, particularly in firms that have targeted niche markets, for self-motivated, flexible professionals with client/server skills.

For example, The Turner Corp. in New York is expanding its IS department by hiring network management people. Project manager Bill Lodge says client/server technologies and networking are hot areas, overall, in the field.

"Network management is huge, and anybody who knows Microsoft Windows, networks and SQL is in demand [in this field]," he says.

He says that when searching for a construction engineer, the company competes with five firms. But when looking for network management experts, the company is up against New York's financial services organizations and cannot offer them a competitive salary.

However, opportunities get better outside of the Big Apple, says IS manager Timothy Minahan at J. A. Jones Construction Co. in Charlotte, N.C. Minahan has just hired an RPG programmer for IBM's Application System/400 platform and a technical support person who will be responsible for PC troubleshooting.

"People looking for jobs should concentrate on client/server technologies. They are the most appropriate [skills] for construction companies that need information at distributed sites but also need centralized information for business applications," Minahan says.

The job sites can remotely access historical cost information, which provides a base for them to project their future costs on a job, Minahan says. Because this requires the use of laptops, network experts are in demand.

People who have the ability to change and be flexible, such as someone who has a networking background and gateway or Token Ring experience, can handle some PC support and can also function in the AS/400 environment, will go far, he says.

> Construction firms are realizing that IS can supply them with technology to run their businesses better.

Lodge says he looks for professionals who have people skills and the ability to interact with end users. This wasn't always the case, but his firm has downsized and is moving into PCs with a vengeance.

But all of this will take time. Construction industry watchers are hopeful that the Clinton presidency will translate into jobs if he is successful in reviving the real estate market and the economy. This doesn't help those trying to find an IS job in the field right now, though.

"The construction industry is facing poor economic conditions, and the consolidations in the financial services industry left a lot of people out of work. That doesn't leave much in the way of IS opportunities in this industry [right now]," Winston says.

Winston says he has recently replaced some employees, but the firm is not expanding its IS department.

Mitchell Draper, micro support manager at Lewis Homes Management Corp. in Upland, Calif., says the construction industry is way behind other industries in IS implementation and career possibilities. For example, while Lewis Homes has almost 1,000 employees, the data processing staff consists of only five people.

### In the beginning

Draper says the problem may lie in a firm's history. Many construction companies evolved from a single contractor that expanded into a larger firm, and the environment is not technology-oriented.

But Draper holds strong hopes for the industry's future. "It is going to get better," he says, because the industry is realizing how it can use information to a competitive advantage.

Draper says construction firms are starting to realize that IS can supply them with information and technology that they can use to run their businesses better. In addition to making use of historical information to project job site results, Draper has set up automated fax bidding to reach a larger number of subcontractors with competitive bids.

Leinfuss is a free-lance writer based in Sarasota, Fla.

Construction

Typically, construction firms in manufacturing, IS systems professionals with domain knowledge of [illegible] have found it hard to program what areas of the country have the most IS opportunities in construction, they were drawn to where there are the least — the Northwest. They say building has ground to a halt due to the weak economic conditions in the area.

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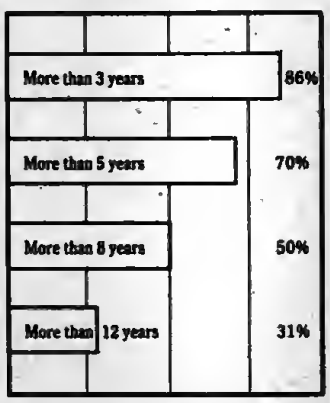


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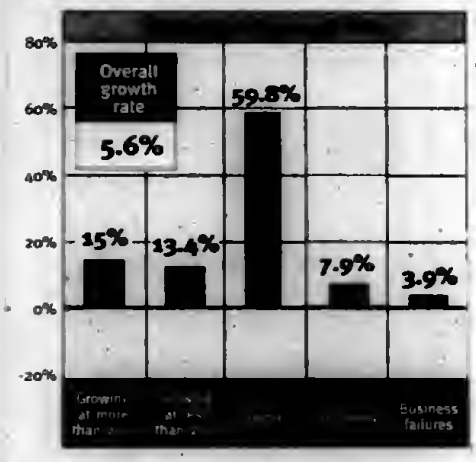


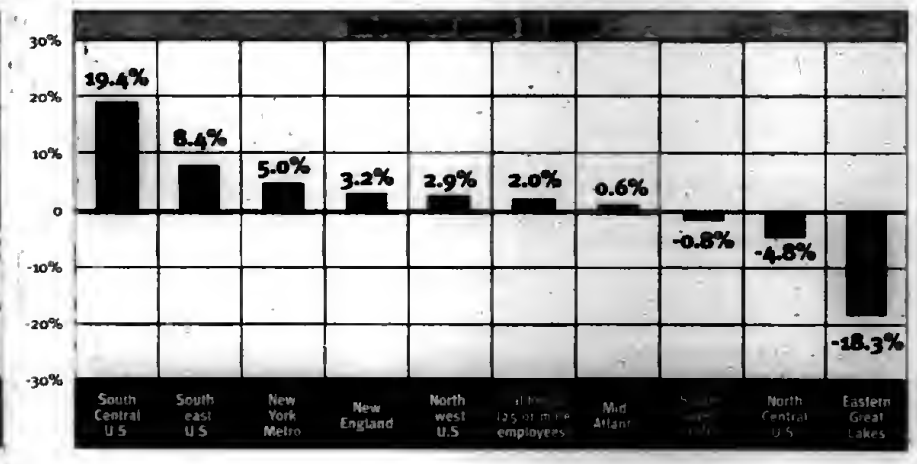


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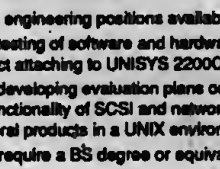


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# Gray market 'deals' aren't always a deal

By Daniel Lyons

THE GRAY MARKET. THE WORDS CONjure up images of shadowy deals taking place in back alleys with suitcases of cash changing hands. OK, that may be an exaggeration, but the risk of buying PCs from this group of unauthorized dealers is not.

Dealers in the gray market tempt buyers with their reduced prices. However, buyers run a number of risks, the biggest of which is warranty protection. Some manufacturers — notably IBM and Compaq Computer Corp. — will not honor a customer's warranty unless the machine was bought from an authorized dealer. Other companies, such as Toshiba America Information Systems, Inc. and Hewlett-Packard Co., will often honor warranties no matter who sold the machine.

Gray marketeers also jeopardize manufacturer warranties by adding used or off-brand components to a name-brand computer. Even if the substitute parts are good, some manufacturers won't honor their warranties once the PC has been altered.

"The main issue is on disk drives and memory — whether it's the original manufacturer's disk drive and memory or it's someone else's jury-rigged in there," says John Murphy, editor and publisher of "The PC Street Price Index," a monthly newsletter that tracks computer prices.

How can you tell up front whether a dealer is authorized? Start by simply asking the dealer and keeping in mind that he might not tell the truth. The issue gets muddied by the fact that dealers can be authorized to sell some products and not others.

Therefore, the best thing to do is call the manufacturer whose product you're evaluating and check out the dealer's authorization. If the dealer is unauthorized, ask the vendor about its policy on gray-market machines.

"You have to see a gray marketeer around for at least six months before you do business with him. Otherwise, you can place an order and just wave goodbye once the check clears," says John Murphy, editor and publisher of the "PC Street Price Index."

Products most likely to be sold by gray marketeers are name-brand equipment. Off-brands are already inexpensive, and it's not as difficult for dealers to get authorization to sell them.

Be aware, too, that gray marketeers generally don't carry the cutting edge of a vendor's product line. You may be getting a discontinued model or configuration — which might not be a bargain at all. "A lot of what's going through the gray market is product that the authorized dealers are having a hard time moving. You might save a bundle, but it won't be the latest technology," says Brian Clarke, PC pricing analyst at International Data Corp. in Framingham, Mass.

### Telltale signs

You can tell that a PC is from the gray market when it's either missing its warranty card or the dealer neglected to stamp it, which makes it useless. Also, some gray marketeers will alter or remove the machine's serial numbers to make it more difficult to track the source of the unit.

Although vendors don't like to admit it, you do have recourse if you've bought a gray market unit. Vendors that claim they don't honor warranties will often provide coverage if badgered.

The trouble is that authorized service centers won't want to touch your machine unless they are certain the manufacturer will reimburse them. So you'll have to haggle with the manufacturer and then get it to persuade the service center to handle your problem.

Is it worth it to buy from the gray market? You can save 10% to 15%, cross your fingers and hope that the machine doesn't ever need service. "After all, how often does a PC break down?" Murphy says.

For the corporate buyer, however, the gray market probably makes sense only for single purchases. On big purchases, where the volume discounts are already good and where peace of mind is important, it's worth it to go through legitimate channels, Murphy says.

Lyons is a free-lance writer based in Ann Arbor, Mich.

## Buyer beware

Recently, a customer shopping for a notebook computer found a good price on a Compaq Computer Corp. Contura 3/20, but the computer arrived with a blank warranty card. To get service on a Contura, Compaq officials say, the card has to be stamped and filled out by an authorized dealer.

The reseller insisted his store was authorized. A call to Compaq revealed that it was not. The store manager gave explanations from "We bought from an authorized dealer, so you're OK," to "We're authorized to sell some, but not all." He was wrong on all counts.

Finally, the dealer promised to have a legitimate Compaq dealer ship one out.

A replacement machine arrived a week later without a receipt or packing slip and with another unstamped warranty card. The reseller said the receipt was coming and arranged to have the warranty card stamped.

The whole process took three weeks. The moral of the story: Scope out your dealer before you buy.


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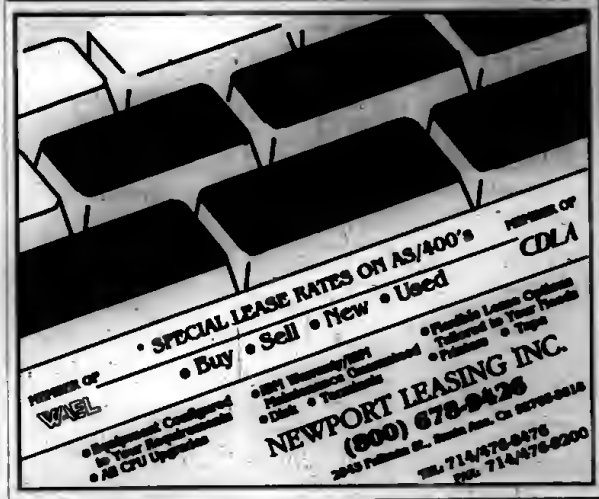
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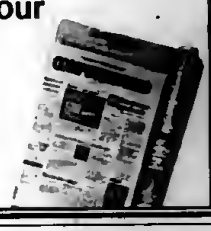

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| Compaq Portable II | $425 | $275 |
| Portable III | $500 | $325 |
| Portable 386 | $950 | $775 |
| SLT-286 | $650 | $675 |
| LTE-286 | $700 | $750 |
| DeskPro 386s | $850 | $850 |
| Apple Blackstock Classic | $700 | $700 |
| SE | $675 | $675 |
| NX | $2,100 | $1,800 |
| NCI | $2,350 | [illegible] |
| NFX | $3,250 | $2,700 |

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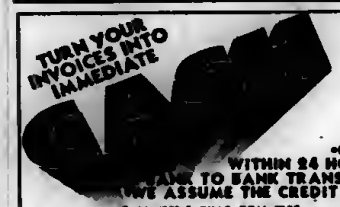


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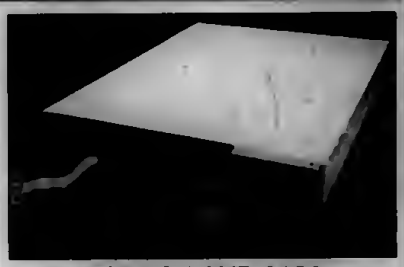

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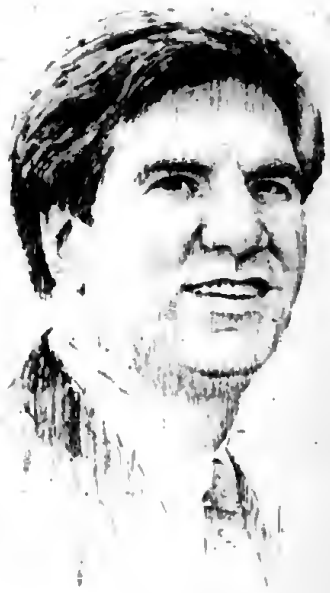

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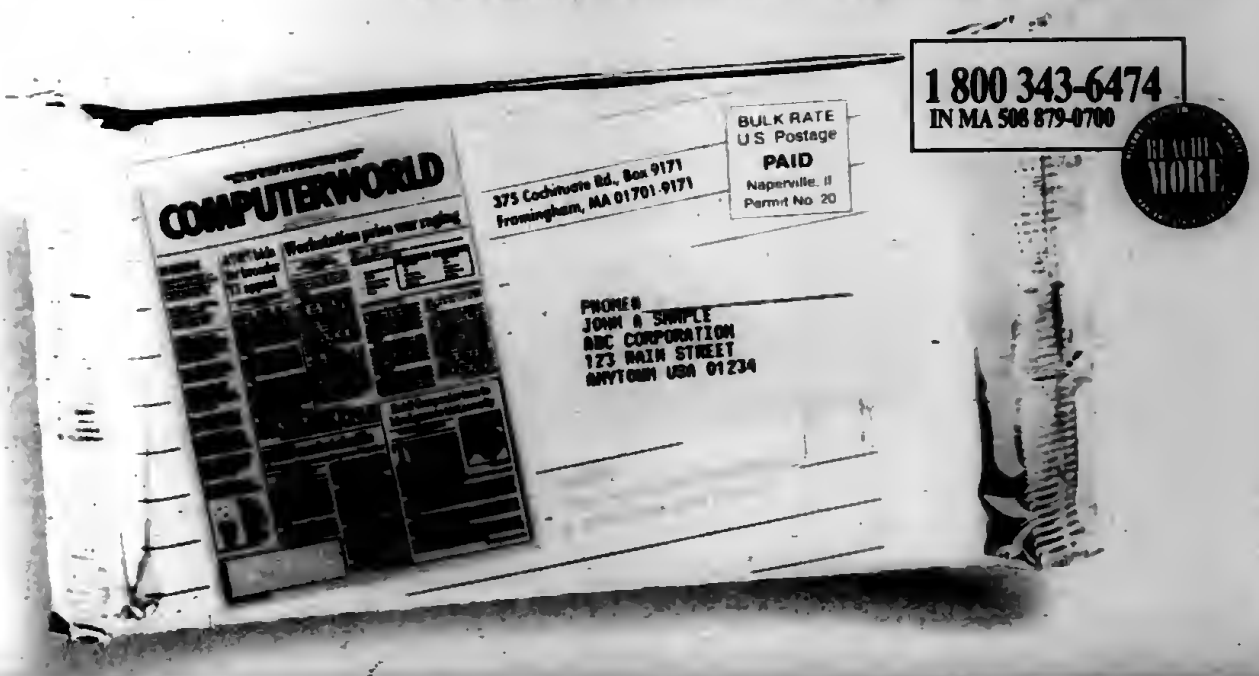

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| | | | |
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| Wang Labs Inc. (B) | 237.6 | Exabyte Corp. | -23.5 |
| Boole & Babbage | 34.3 | Gallery Interactive Systems (L) | -22.4 |
| Advanced Logic Research | 24.1 | Scientific Atlanta Inc. (H) | -20.9 |
| Aspect Communication Corp | 21.9 | Pyramid Technology | -19.2 |
| Sierra Semiconductor | 20.7 | Spreadsheet Software | -18.7 |
| Computervision Corp. | 19.5 | AST Research Inc. | -18.3 |
| CompuServ (H) | 15.3 | Symantec Corp. | -17.6 |
| Data Switch Corp. | 12.2 | Motorola Inc. (L) | -16.7 |

### Dollar

| | | | |
|---|---|---|---|
| Boole & Babbage | +5.25 | Motorola Inc. (L) | -10.00 |
| Computer Sciences | 4.25 | Scientific Atlanta Inc. (H) | -6.13 |
| IBM | 3.88 | Synoptics Communications | -6.00 |
| Matsushita Electronics | 2.63 | Cisco Systems Inc. (H) | -5.50 |
| CompSoft (H) | 2.50 | Intel Corp. | -5.50 |
| Peoplesoft (H) | 2.25 | Cabletron Systems (H) | -4.25 |
| Northern Telecom Ltd. | 2.25 | Wellfleet Communications | -4.25 |
| Sierra Semiconductor | 2.25 | Southwestern Bell Corp | -4.25 |

# Turnaround candidates

Computer industry companies have been quick to point fingers at the soft economy for losses suffered during the past couple of years. However, according to a report by Donaldson, Lufkin & Jenrette Securities Corp., desktop software vendors have their destinies firmly in their own hands.

In the report, Scott Smith, vice president at Donaldson, Lufkin, said product cycles matter more than overall economic conditions in determining the success or failure of these companies. Smith said that because selective software purchasing can improve employee productivity and cut costs, the recession has not significantly hurt sales of desktop software. A corollary, though, is that an uptick in the economy will not have a dramatic positive effect on the software sector.

Donaldson, Lufkin noted that favorable product cycles and large installed bases helped **Computer Associates International, Inc.** (CA) and **Oracle Corp.** (ORCL) stage significant turnarounds in the past calendar year. Candidates for similar improvements this year include **Lotus Development Corp.** (LOTS), **KnowledgeWare, Inc.** (KNOW), **Symantec Corp.** (SYMC) and **Easel Corp.** (EASL), although each company has crucial competitive challenges ahead:

- Lotus dropped 25% of its share value last year. Its chances this year are bolstered by an increasingly strong set of Microsoft Corp. Windows products, including Ami Pro, Freelance Graphics and the forthcoming Version 2.0 of 1-2-3 for Windows. The innovative Improv spreadsheet is also in the pipeline, and Lotus' Notes is expected to prosper as the groupware market picks up steam. Donaldson, Lufkin rated Lotus as Moderately Attractive.
- Computer-aided software engineering (CASE) vendor KnowledgeWare will face continued stiff competition in the CASE arena, according to Donaldson, Lufkin. However, the firm has just released a new generation of its CASE tools and has announced a Unix-based software line scheduled for midyear availability. Donaldson, Lufkin also assigned KnowledgeWare a Moderately Attractive rating.
- Symantec's fortunes will rest on second-quarter delivery of upgraded Windows versions of its Norton products, plus a Windows release of Q&A. Though Donaldson, Lufkin said Symantec will likely report a loss for the first quarter of 1993, the stock is rated Moderately Attractive.
- Client/server supplier Easel has repositioned its two lines of application development tools and cut costs. It faces a grueling marketplace battle with such companies as Powersoft Corp., Microsoft and KnowledgeWare but also earned a Moderately Attractive rating from Donaldson, Lufkin.

*— Derek Slater*

| Exch | 52-Week Range | | | Jan. 29 3 PM | Wk Net Change | Wk Pct Change |
|---|---|---|---|---|---|---|
| **COMMUNICATIONS AND NETWORK SERVICES** | | | | | | |
| OTC | 34.63 | 9.63 | 3Com Corp (H) | 31.00 | 3.38 | 9.8 |
| NYS | 74.75 | 56.25 | American Info Techs Corp (H) | 71.75 | -2.63 | -3.5 |
| NYS | 55.25 | 36.63 | AT&T (H) | 53.00 | 1.00 | 1.9 |
| OTC | 4.25 | 0.75 | Aztec Communication Corp | 2.44 | 0.44 | 21.9 |
| OTC | 24.50 | 10.25 | Banyan Systems Inc. | 21.75 | 2.00 | 8.4 |
| NYS | 51.88 | 40.25 | Bell Atlantic Corp | 51.50 | -1.88 | -3.5 |
| NYS | 55.50 | 43.38 | BellSouth Corp | 51.75 | 2.75 | 5.0 |
| NYS | 6.75 | 1.63 | Bolt, Beranek & Newman | 5.00 | -0.38 | -7.0 |
| OTC | 17.25 | 10.00 | Brooktrout Technology | 16.13 | 0.13 | 0.8 |
| NYS | 92.25 | 62.13 | Cabletron Systems (H) | 85.50 | 4.25 | -4.7 |
| OTC | 34.25 | 17.75 | Chipcom Corp (H) | 30.25 | -0.50 | -1.6 |
| OTC | 94.06 | 35.00 | Cisco Systems Inc. (H) | 88.00 | -5.50 | -5.9 |
| OTC | 24.13 | 5.50 | Compression Labs Inc. | 12.00 | 1.50 | +11.1 |
| OTC | 3.38 | 0.88 | Data Switch Corp | 2.88 | 0.31 | 12.2 |
| NYS | 21.50 | 13.75 | Digital Comm. Assoc. | 19.00 | -0.38 | -1.9 |
| OTC | 14.75 | 7.50 | Digital Systems Int'l Inc. | 9.11 | -0.38 | -3.9 |
| OTC | 20.00 | 4.00 | DSC Communications (H) | 17.25 | -0.75 | -2.8 |
| OTC | 10.88 | 4.75 | Fibronics Int'l Inc. | 8.38 | 0.88 | 13.7 |
| OTC | 37.50 | 30.50 | Filenet Corp | 35.25 | 0.25 | -1.7 |
| OTC | 4.38 | 1.50 | Gandalf Technologies Inc | 3.75 | 0.13 | 3.6 |
| OTC | 2.25 | 0.69 | Gateway Communications | 1.38 | 0.06 | 4.6 |
| NYS | 10.00 | 2.88 | General Datacomm Inds. (H) | 9.13 | 0.00 | 0.0 |
| ASE | 5.88 | 1.75 | Go Video | 3.94 | 0.13 | 3.4 |
| NYS | 35.75 | 28.88 | GTE Corp | 35.00 | -0.38 | -1.1 |
| NYS | 75.25 | 57.63 | ITT Corp. (H) | 71.88 | 2.50 | 3.6 |
| OTC | 63.38 | 29.50 | MCI Communications Corp | 39.75 | -2.00 | -4.8 |
| OTC | 14.25 | 2.25 | Micrognosis Inc. | 5.75 | 0.38 | 7.0 |
| OTC | 22.00 | 12.00 | Netrix Corp. (H) | 22.00 | 1.50 | 7.3 |
| OTC | 18.75 | 9.63 | Network Computing Devices | 16.00 | 0.75 | 4.9 |
| NYS | 18.25 | 8.13 | Network Equipment Tech. | 10.50 | 1.19 | 12.0 |
| OTC | 29.25 | 8.00 | Network General | 16.38 | 1.25 | 7.1 |
| OTC | 17.38 | 8.50 | Network Systems Corp | 11.00 | -0.13 | -1.1 |
| OTC | 48.25 | 11.88 | Newbridge Networks Corp (H) | 45.25 | -2.88 | -6.0 |
| NYS | 49.25 | 30.50 | Northern Telecom Ltd | 43.50 | 2.25 | 5.5 |
| OTC | 33.50 | 22.50 | Novell Inc | 30.75 | -0.50 | -1.6 |
| NYS | 88.50 | 69.13 | Rymer Corp | 82.38 | 2.63 | -3.1 |
| OTC | 37.50 | 14.50 | Octel Communications Corp | 36.25 | 1.50 | -5.8 |
| OTC | 9.38 | 3.38 | Penril Data Comm Networks | 5.25 | -0.25 | -4.5 |
| OTC | 53.00 | 10.25 | Picturetel Corp | 26.00 | -3.75 | 12.6 |
| OTC | 10.75 | 7.00 | Proteon Inc | 10.63 | 0.25 | 2.3 |
| NYS | 30.38 | 20.38 | Scientific Atlanta Inc. (H) | 23.25 | 0.13 | 20.9 |
| NYS | 75.63 | 56.63 | Southwestern Bell Corp | 69.13 | -0.25 | -5.0 |
| NYS | 38.13 | 20.75 | Sprint Corp. (H) | 27.00 | 1.11 | -4.0 |
| OTC | 27.00 | 7.50 | Standard Microsystems Corp | 19.75 | -2.50 | 11.2 |
| OTC | 18.50 | 6.88 | Stratacom Inc. (H) | 16.50 | -0.50 | -2.9 |
| OTC | 95.50 | 18.75 | Synoptics Communications | 85.88 | 6.00 | -6.5 |
| OTC | 7.13 | 4.38 | Telebit Corp | 5.88 | -0.13 | -2.1 |
| OTC | 9.38 | 2.13 | Telematics Int'l Inc | 8.75 | 0.63 | 7.0 |
| OTC | 29.50 | 13.38 | US Robotics (H) | 22.00 | -1.50 | -6.4 |
| NYS | 80.00 | 32.88 | US West Inc. | 38.50 | -0.63 | -1.6 |
| OTC | 46.00 | 12.00 | Wellfleet Communications | 40.75 | -4.25 | -9.4 |
| OTC | 22.00 | 7.00 | Xylogics | 8.25 | -0.50 | -5.7 |
| **PCS AND WORKSTATIONS** | | | | | | |
| OTC | 8.50 | 3.13 | Advanced Logic Research | 4.19 | 0.81 | 24.1 |
| OTC | 70.00 | 41.50 | Apple Computer Inc | 59.50 | -0.50 | -0.8 |
| OTC | 24.25 | 11.25 | AST Research Inc. | 18.13 | 4.00 | -18.1 |
| NYS | 36.25 | 6.13 | Commodore Int'l. | 6.50 | -0.75 | -10.3 |
| NYS | 50.50 | 22.25 | Compaq Computer Corp | 51.88 | 1.00 | -5.5 |
| OTC | 49.88 | 15.00 | Dell Computer Corp (H) | 46.75 | -0.11 | 0.3 |
| NYS | 38.63 | 26.63 | Harris Corp | 35.25 | 0.00 | 0.0 |
| NYS | 85.00 | 50.25 | Hewlett Packard Co | 71.75 | -1.38 | -1.9 |
| NYS | 13.00 | 34.13 | Silicon Graphics (H) | 31.00 | 2.00 | -6.1 |
| OTC | 41.00 | 22.50 | Sun Microsystems Inc. (H) | 39.00 | 2.00 | -1.3 |
| NYS | 32.13 | 22.25 | Tandy Corp | 26.50 | -0.75 | -2.8 |
| NYS | 11.13 | 5.00 | Zenith Electronics | 6.13 | 0.25 | 4.3 |
| OTC | 25.50 | 2.75 | Zeos International Ltd | 6.13 | -0.50 | 0.9 |
| **LARGE SYSTEMS** | | | | | | |
| ASE | 20.63 | 6.63 | Amdahl Corp | 8.50 | 0.63 | 7.9 |
| NYS | 16.38 | 4.75 | Cobvea Computer | 7.00 | -0.38 | -5.1 |
| OTC | 9.50 | 1.88 | Cray Computer | 4.75 | -0.25 | 5.0 |
| NYS | 48.50 | 19.00 | Cray Research Inc. | 27.63 | 0.38 | 1.3 |
| NYS | 11.00 | 7.13 | Data General Corp | 11.50 | -0.25 | 2.1 |
| NYS | 65.50 | 30.38 | Digital Equipment Corp | 42.11 | 0.25 | 1.7 |
| NYS | 100.38 | 45.88 | IBM | 51.38 | 2.88 | 5.9 |
| OTC | 19.50 | 5.50 | Kendall Square Research | 18.00 | 0.00 | 0.0 |
| NYS | 117.00 | 81.00 | Matsushita Electronics | 91.38 | 2.63 | 3.0 |
| OTC | 12.50 | 6.00 | Pyramid Technology | 10.50 | 1.25 | 9.4 |
| OTC | 24.00 | 11.13 | Sequent Computer Sys. (H) | 20.38 | -2.50 | 10.9 |
| OTC | 16.38 | 1.38 | Sequoia Systems Inc | 1.75 | 0.06 | 3.2 |
| NYS | 54.25 | 29.50 | Stratus Computer Inc | 32.25 | 1.25 | 3.7 |
| NYS | 36.88 | 9.88 | Tandem Computers Inc | 11.75 | 0.13 | 0.9 |
| NYS | 13.75 | 7.25 | Unisys Corp. (H) | 12.38 | -0.50 | 3.9 |
| ASE | 7.50 | 0.88 | Wang Labs Inc. (B) | 1.09 | 1.19 | 237.8 |
| **SOFTWARE** | | | | | | |
| OTC | 65.00 | 25.25 | Adobe Systems Inc. | 41.25 | 3.75 | 0.1 |
| OTC | 35.00 | 10.25 | Aldus Corp | 14.50 | 1.25 | 2.9 |
| OTC | 19.75 | 7.00 | American Software Inc | 8.63 | 0.00 | 0.0 |
| OTC | 25.38 | 9.75 | Asa Computer Systems (H) | 21.25 | 0.88 | 8.6 |
| OTC | 46.50 | 21.25 | Autodesk Inc | 46.75 | 2.13 | 4.1 |
| OTC | 17.75 | 1.50 | Bachman Info Systems (L) | 3.88 | -0.38 | 0.0 |
| OTC | 61.00 | 34.00 | BGS Systems Inc. | 80.29 | -0.25 | 1.8 |
| OTC | 84.13 | 37.25 | BMC Software Inc | 76.25 | 2.50 | 3.2 |
| OTC | 37.00 | 10.75 | Borland Int'l Inc | 27.00 | 3.25 | 24.1 |
| OTC | 82.50 | 17.50 | Borland Int'l Inc | 21.38 | 1.38 | 6.9 |
| OTC | 10.50 | 3.00 | CE Software (L) | 3.75 | 0.38 | 11.1 |
| ASE | 35.00 | 9.38 | Cheyenne Software Inc (H) | 11.38 | 2.63 | 2.2 |
| OTC | 18.00 | 8.25 | ChipSoft (H) | 19.00 | 2.50 | 15.2 |
| OTC | 11.88 | 5.63 | Cognos Inc | 7.63 | 0.38 | -1.2 |
| NYS | 37.38 | 10.88 | Computer Associates (H) | 25.63 | 1.00 | 3.8 |
| NYS | 12.38 | 4.00 | Computervision Corp | 6.11 | 1.00 | 19.5 |
| OTC | 18.50 | 6.75 | Consumate Inc | 10.00 | -0.75 | 2.0 |
| OTC | 17.25 | 11.38 | Corel Corp | 11.63 | 0.13 | 1.3 |
| OTC | 46.50 | 6.00 | Easel Corp | 11.00 | -0.50 | -4.3 |
| OTC | 26.50 | 11.75 | Frame Technology | 17.00 | 1.88 | -9.9 |
| OTC | 25.50 | 12.50 | Group I Software | 13.00 | 0.50 | 4.0 |
| OTC | 8.25 | 3.50 | Hogan Systems Inc. (H) | 7.88 | 0.00 | 0.0 |
| OTC | 25.75 | 13.75 | HMS | 14.00 | 2.50 | 35.2 |
| OTC | 36.25 | 18.50 | Information Resources | 30.00 | -1.25 | -4.0 |
| OTC | 47.00 | 31.88 | Informix Corp (H) | 36.61 | -1.38 | 3.8 |
| OTC | 21.25 | 11.00 | Intergraph Corp | 11.75 | 1.25 | 9.6 |
| OTC | 15.00 | 7.75 | Interleaf Inc. | 11.25 | -0.38 | 3.2 |
| OTC | 19.75 | 10.25 | Intersolv Inc. | 11.00 | -1.00 | -7.3 |
| OTC | 21.38 | 9.50 | Knowledgeware Inc. | 12.25 | -0.25 | -1.9 |
| OTC | 54.00 | 20.75 | Legent Corp. (H) | 51.25 | 0.00 | 0.0 |
| OTC | 38.75 | 14.25 | Lotus Development | 23.00 | -0.75 | -3.2 |
| OTC | 23.25 | 19.00 | McAfee Associates | 15.13 | -0.75 | -4.7 |
| OTC | 8.38 | 1.88 | Mega Software (H) | 7.50 | -0.63 | -7.7 |
| OTC | 22.25 | 3.25 | Mentor Graphics | 10.00 | 0.63 | 6.7 |
| OTC | 46.00 | 27.25 | Micro Focus (H) | 43.63 | 0.88 | 2.0 |
| OTC | 20.50 | 6.50 | Microgrape Inc | 11.00 | 1.00 | -8.3 |
| OTC | 95.00 | 85.50 | Microsoft Corp. | 86.75 | -3.00 | -3.3 |
| OTC | 36.38 | 12.00 | Oracle Corp. (H) | 31.50 | -2.25 | -6.7 |
| OTC | 63.25 | 25.25 | Parametric Technology (H) | 59.38 | -0.13 | -0.2 |
| OTC | 38.50 | 22.50 | Peoplesoft (H) | 36.75 | 2.25 | 6.5 |
| OTC | 11.00 | 3.50 | Phoenix Technologies | 5.25 | -1.25 | -19.2 |
| OTC | 25.00 | 11.25 | Platinum Technology (H) | 21.25 | -1.75 | 7.6 |
| OTC | 81.50 | 29.00 | Progress Software Corp | 55.75 | -0.75 | 1.3 |
| OTC | 24.50 | 3.13 | Quarterdeck Office Sys | 3.94 | 0.00 | 0.0 |
| OTC | 32.75 | 13.75 | Rainbow Technologies Inc. | 18.50 | 0.00 | 0.0 |
| OTC | 22.75 | 6.00 | Rasterops | 8.00 | 0.75 | 10.3 |
| OTC | 37.25 | 9.63 | Ross Systems | 9.50 | -0.50 | -5.0 |
| OTC | 27.75 | 8.50 | Sapiens USA Inc. | 23.50 | -1.00 | -4.1 |
| OTC | 26.25 | 6.75 | Software Publishing Corp. | 12.00 | -0.50 | -4.0 |
| OTC | 8.88 | 2.00 | Software Toolworks Inc. | 8.00 | 0.75 | 9.2 |
| OTC | 7.25 | 0.75 | Spinnaker Software | 1.50 | -0.34 | 18.7 |
| OTC | 36.50 | 3.25 | State of the Art | 9.25 | 0.50 | 5.7 |
| NYS | 25.25 | 13.75 | Sterling Software Inc. | 22.63 | 0.00 | 0.0 |
| OTC | 25.25 | 8.00 | Structr Dynamics Research | 13.13 | -0.13 | 0.9 |
| OTC | 56.75 | 21.00 | Sybase Inc. (H) | 55.25 | 0.50 | 0.9 |
| OTC | 48.75 | 5.88 | Symantec Corp | 10.50 | 2.25 | 17.8 |
| NYS | 13.50 | 5.25 | Systems Center Inc | 7.61 | -0.38 | -4.7 |
| OTC | 25.50 | 31.84 | Systems Software Assoc. | 10.50 | 0.25 | 1.4 |
| OTC | 13.25 | 2.50 | Trimble Corp | 4.38 | -0.75 | 14.6 |
| OTC | 23.75 | 11.25 | Walker Interactive Systems (L) | 11.25 | 3.25 | 22.6 |
| OTC | 4.38 | 1.38 | Wordstar | 2.63 | 0.19 | 8.7 |
| **SEMICONDUCTORS** | | | | | | |
| NYS | 21.50 | 7.38 | Advanced Micro Devices | 10.63 | 2.25 | 6.3 |
| NYS | 17.38 | 8.63 | Analog Devices Inc (H) | 16.63 | -0.25 | 1.5 |
| OTC | 24.13 | 7.38 | Atmel Corp (H) | 18.00 | -0.88 | -6.6 |
| OTC | 14.13 | 3.25 | Chips And Technologies | 4.25 | -0.25 | 5.6 |
| NYS | 16.88 | 7.38 | Cypress Semiconductor Corp | 10.88 | -1.00 | 8.4 |
| NYS | 16.13 | 7.00 | Dallas Semiconductor (H) | 14.38 | -0.38 | -2.5 |
| OTC | 118.00 | 46.50 | Intel Corp | 108.25 | -5.50 | -4.8 |
| NYS | 12.75 | 4.88 | LSI Logic Corp (H) | 10.88 | -0.88 | 7.4 |
| NYS | 23.63 | 12.88 | Micron Technology | 22.75 | 0.11 | -0.5 |
| NYS | 83.00 | 36.44 | Motorola Inc (L) | 50.00 | -10.00 | 16.7 |
| NYS | 14.13 | 7.50 | National Semiconductor | 11.75 | 0.38 | 3.3 |
| OTC | 25.50 | 8.25 | Sierra Semiconductor | 13.38 | 2.25 | 20.2 |
| OTC | 38.50 | 22.25 | SyncOptics | 33.75 | -1.25 | 3.6 |
| NYS | 59.25 | 31.50 | Texas Instruments | 53.50 | -1.50 | 2.7 |
| OTC | 10.50 | 6.00 | VLSI Technology | 7.75 | -0.25 | 3.1 |
| OTC | 7.63 | 2.13 | Weitek | 6.25 | -0.88 | -12.3 |
| ASE | 9.63 | 3.50 | Western Digital Corp | 8.88 | 0.38 | 4.4 |
| NYS | 33.25 | 14.50 | Xilinx (H) | 29.50 | -3.25 | -9.9 |
| OTC | 37.13 | 17.50 | Zilog Inc. | 32.33 | -2.00 | -5.1 |
| **PERIPHERALS AND SUBSYSTEMS** | | | | | | |
| OTC | 28.75 | 10.38 | American Power Conversion | 25.50 | -1.00 | 3.6 |
| OTC | 30.25 | 17.75 | Banctec Inc. (H) | 27.25 | -2.50 | 8.4 |
| OTC | 23.50 | 9.25 | Cambex Corp | 14.00 | 0.00 | 0.0 |
| ASE | 17.88 | 6.00 | Cmd Technology Corp. | 17.88 | 0.75 | 4.4 |
| NYS | 29.50 | 16.75 | Comrex Peripherals (H) | 23.75 | 0.25 | 3.1 |
| OTC | 36.75 | 10.75 | Creative Technologies Inc. (H) | 32.25 | -1.25 | -3.7 |
| OTC | 30.75 | 14.25 | Data Race Inc. (H) | 27.50 | -0.75 | -2.7 |
| ASE | 19.66 | 6.75 | Dataram Corp | 10.50 | 0.75 | -6.7 |
| NYS | 28.00 | 7.25 | EMC Corp (H) | 25.75 | -0.75 | -2.8 |
| OTC | 10.50 | 5.38 | Emulex Corp | 8.50 | -2.00 | -23.5 |
| OTC | 20.75 | 13.25 | Evans & Sutherland | 18.25 | 0.75 | 4.3 |
| OTC | 80.63 | 12.00 | Exabyte | 14.63 | 0.00 | 0.0 |
| OTC | 78.00 | 19.00 | Intelligent Info. Systems | 20.00 | 0.00 | 0.0 |
| OTC | 13.25 | 4.75 | Ionwerk Corp | 6.25 | -0.25 | -3.8 |
| OTC | 34.25 | 9.25 | IPL Systems Inc. | 9.25 | 1.25 | -11.9 |
| OTC | 23.25 | 10.75 | Komag Inc. | 19.88 | 2.13 | 12.0 |
| OTC | 14.25 | 5.38 | Maxtor Corp | 10.63 | 1.25 | -10.5 |
| OTC | 12.63 | 7.11 | Micropolis Corp | 8.88 | 0.13 | -1.4 |
| NYS | 107.00 | 85.50 | 3M Corp | 98.25 | -0.50 | -0.5 |
| OTC | 7.75 | 4.00 | Pinnacle Inc. (H) | 7.25 | 0.75 | 11.5 |
| NYS | 10.38 | 0.88 | QMS Inc. (H) | 14.63 | -0.93 | -4.1 |
| OTC | 18.00 | 12.11 | Quantum Corp. | 14.00 | -0.38 | -2.3 |
| OTC | 12.75 | 3.75 | Radius Inc | 5.38 | 0.31 | 2.6 |
| NYS | 16.25 | 7.50 | Reconditron Equipment | 14.88 | -1.00 | -6.3 |
| OTC | 13.88 | +6.50 | Rexon Inc | 7.00 | -0.88 | -11.1 |
| OTC | 22.38 | 12.00 | Seagate Technology | 18.50 | 0.13 | 0.7 |
| NYS | 78.00 | 18.38 | Storage Technology | 20.13 | 0.38 | 1.8 |
| NYS | 23.25 | 18.50 | Tektronix Inc (H) | 23.25 | 0.75 | 3.3 |
| NYS | 87.50 | 66.75 | Xerox Corp. (H) | 84.00 | 3.13 | 1.4 |
| **SERVICES** | | | | | | |
| OTC | 23.50 | 12.16 | American Mgmt. Systems | 22.25 | 1.00 | 4.3 |
| NYS | 5.38 | 3.00 | Analogic Inc | 4.13 | 0.25 | 5.7 |
| OTC | 35.75 | 16.00 | Analysts Int'l (H) | 32.00 | 3.50 | -4.5 |
| NYS | 55.61 | 38.75 | Auto Data Processing | 51.00 | -1.13 | 2.2 |
| OTC | 17.25 | 8.97 | Cadmus Corp | 15.25 | 0.25 | 3.7 |
| OTC | 20.00 | 12.50 | Comdisco Inc | 14.13 | 0.13 | 0.9 |
| OTC | 13.50 | 6.75 | Computer Horizons | 10.50 | -1.50 | -12.5 |
| NYS | 84.88 | 57.00 | Computer Sciences | 79.83 | 4.25 | 5.6 |
| NYS | 10.13 | 7.13 | Computer Task Group | 8.00 | -0.88 | 9.9 |
| NYS | 80.50 | 22.00 | CompuUSA Inc | 30.75 | 3.25 | 9.6 |
| OTC | 19.25 | 8.00 | Corporate Software | 12.11 | 1.25 | 9.3 |
| OTC | 30.75 | 7.75 | Egghead Discount Software | 10.00 | 0.50 | 4.8 |
| NYS | 15.88 | 25.25 | General Motors 1 (EDS) (H) | 31.88 | 0.88 | 2.7 |
| OTC | 22.25 | 9.25 | Informix Corp. (H) | 13.00 | 0.50 | 7.4 |
| OTC | 30.38 | 6.25 | Intelligent Electronics | 14.50 | 0.38 | 2.7 |
| OTC | 14.88 | 6.63 | Merisel | 12.25 | 0.38 | 3.2 |
| OTC | 15.75 | 5.75 | Microage Inc | 12.50 | 0.00 | 0.0 |
| OTC | 48.00 | 21.88 | Paychex | 35.75 | 0.00 | 0.0 |
| NYS | 83.50 | 58.75 | Policy Manage ment Sys | 79.25 | 0.38 | 0.5 |
| NYS | 29.63 | 16.81 | Reynolds and Reynolds (H) | 28.50 | 1.00 | 3.5 |
| OTC | 32.00 | 22.00 | SEI Corp | 28.75 | -1.63 | 6.3 |
| OTC | 24.38 | 16.88 | Shared Medical Systems | 23.38 | 0.75 | 3.3 |
| OTC | 14.38 | 5.75 | SHL Systemhouse | 7.13 | -0.13 | 1.7 |
| OTC | 29.75 | 18.25 | Software Spectrum Inc | 25.25 | -1.25 | -4.7 |
| OTC | 32.25 | 20.25 | Sungard Data Systems (H) | 31.88 | 1.88 | 6.3 |
| NYS | 3.63 | 1.13 | Ultimate Corp | 1.88 | -0.25 | -11.8 |

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Note: Motorola Inc. completed a 2-for-1 stock split

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# Cautious optimism for Q1 '93

## Analysts express high hopes for large-systems software companies

By Derek Slater

Calendar fourth-quarter results offer mixed omens for the near-term future of the computer industry. While Microsoft Corp. and Compaq Computer Corp. (see story below) showed no signs of slowing their breakneck profitability, a grim IBM made it clear it will be some time before its turnaround efforts bear fruit.

Not surprisingly, the analyst community also posted mixed expectations for the coming year. Gartner Group, Inc., on the optimistic side, predicted exceptional growth for 1993, with sales volume for the whole industry expected to jump to $449 billion, up from $314 billion in 1992. That represents a growth rate that is roughly seven times the industry average for the past four years.

Selected firms are expected to do well in the first quarter, particularly in the large-systems software and networking sectors.

**Large systems**

Data center software suppliers have surprised industry watchers with excellent recent results in spite of the trend toward smaller systems. These firms should continue to fare well, analysts said.

**On the other hand...**

Other analysts were careful when projecting key companies' results for the current quarter. The first calendar quarter is historically weak for all high-tech sectors. "People tend to sit on their budgets for the first and sometimes second quarters," said Terence Quinn, a senior technology analyst at Wall Street firm Furman Selz, Inc.

Terence Quinn, a senior technology analyst at Wall Street firm Furman Selz, Inc., pointed to Computer Associates International, Inc. and utilities supplier BMC Software, Inc. as companies to watch in 1993. "CA is coming back from mistakes they made about two years ago — they've changed the rules of the game in software licensing, which differentiates them from the competition and helps them repair some old relationships with customers," Quinn said.

CA and BMC Software are also hedging their bets with product rollouts for Unix and other lower end platforms.

Legent Corp. and Platinum Technology, Inc. should have solid first-quarter results as well, Quinn said.

On the hardware side, prospects remain particularly gloomy in the near term for IBM, recently humbled by the largest loss in U.S. corporate history. IBM is expected to post operating losses for the first quarter and possibly the second as well.

Digital Equipment Corp. earned mixed forecasts. William Milton Jr. at Brown Brothers Harriman & Co. said DEC may return to profitability by the June quarter. Other analysts, however, said fluctuations in foreign currency may begin to hurt DEC's results around that time period. Things look brighter for Unisys Corp., which can increase profits on flat revenue as it pares down long-term debt and cuts its interest expenses.

Cost-cutting appears to be paying off as many technology companies slashed a larger backlog in losses than revenue

| | | | | |
|---|---|---|---|---|
| | $116.7M | 20% | $19.1M | 51% |
| | $246M | (1)% | $14.6M | 152% |
| | $55.1M | 11% | $.468M | 102% |
| | $88.7M | 44.3% | $6.3M | 509% |
| | $270M | 15% | $24M | 42% |
| | $134.9M | 5% | $17.2M | (2)% |
| | $1.05B | 16% | $34.3M | (28)% |
| | $83.2M | 64% | $10.7M | 143% |

Source: Company reports

**PC hardware**

The first quarter for PC makers will likely be deja vu: The rich will get richer while the poor wrestle with Chapter 11.

Compaq, Dell Computer Corp. and AST Research, Inc. all carry healthy order backlogs, analysts said. According to Stephen Dube, an analyst at Sherwood Research Group, Compaq's next results may even exceed its last, record-setting quarter.

PC sales should continue at a robust pace — International Data Corp. estimates that the total market will jump to $57.1 billion in 1993, up from $51.1 billion — but there will be less for the bottom-tier vendors to distribute.

**PC software**

Among desktop software firms that have floundered of late, Symantec Corp.'s impending product rollouts will help but not until the June quarter, according to Quinn.

Similarly, Borland International, Inc.'s release of Paradox for Windows and unbundling of its Win/DOS Quattro Pro package will help stabilize the company. However, recent problems have saddled Borland with several long-term disabilities.

For example, the company has drastically cut pricing for several of its key products, including Paradox for Windows, in order to counter pressure from Microsoft. Quinn said Borland has also curtailed its spending on research and development.

**Workstations**

Analysts expect continued momentum in the first quarter for Sun Microsystems, Inc. and Silicon Graphics, Inc. Both workstation companies reported record revenue for the December quarter.

# Compaq posts 25% sales uptick

By Michael Fitzgerald

HOUSTON

Compaq Computer Corp. made the biggest splash in last year's price wars and managed to ride that price wave back to profitability.

Compaq, the nation's third-largest PC maker behind the IBM PC Co. and Apple Computer, Inc., last week said 1992 sales soared by 25% to $4.1 billion, reversing a decline suffered in 1991. The company's profit for the year was $213 million, 63% higher than 1991's earnings, though lower than its $455 million profit in 1990.

Users said they were pleased that Compaq appears to have turned around.

At the same time, some expressed concern that Compaq may no longer place as much emphasis on leading the field in technology.

"I'm seeing things from companies like AST Research, Inc. that are more innovative than what's coming from Compaq," said Glen Jurmann, section manager of office technology at one of Compaq's largest customers, Baxter Health-Care Corp. in Deerfield, Ill.

Gian Carlo Bisone, Compaq North America's vice president of marketing, bristled at the suggestion that Compaq is no longer a technology leader.

"One of the key pillars in our success was technology, and while we won't be able to repeat being the sole supplier of 386-based systems again, we are not going to relinquish our technology leadership," he said. Bisone pointed to Compaq's status as the only vendor selling a notebook with a monochrome active-matrix display.

Perhaps more significant to Compaq's long-term health is reduced operating costs. For the fourth quarter of 1992, Compaq operating expenses were 16.4% of total sales, down from 25.7% in the year-earlier quarter. Compaq's high cost of doing business has been slammed by major competitors such as Michael S. Dell, chairman of Dell Computer Corp. in Austin, Texas.

Since then, Compaq has laid off roughly 21% of its work force, adopted new manufacturing techniques and wrung far better pricing out of its component suppliers.

"A year ago . . . I would've agreed [with Dell] a lot more, but today we've changed [our structure] so dramatically that we could go out and do another round of pricing," said Eckhard Pfeiffer, Compaq's president and chief executive officer.

Pfeiffer said Compaq will "optimize" its pricing, and this may well include further price cuts.

Analysts such as Leslie Fiering at Gartner Group, Inc. in Santa Clara, Calif., said Compaq "is definitely out of the woods, but they can't afford to rest on their laurels."

FINANCIAL UPDATE

Compaq

Compaq posted record-setting revenue in 1992

| | 4Q '92 | Year-end 1992 |
|---|---|---|
| Revenue | $1.42B | $4.10B |
| Percent change from same period 1991 | 63% | 25% |
| | | |
| | | |

Source: Company reports

# Wysiwyg

## Kiss those red envelopes good-bye

Consumers shopping for valentines will find fewer cards with passionate red envelopes this year. The U.S. Postal Service is asking greeting-card makers to phase out dark-colored envelopes because its computers have difficulty reading the ZIP code and bar codes on them.

Source: The Atlantic, February 1993

**◄Vanity (plates), thy name is . . .**

NCR 3170 notebooks are being used to take orders for personalized commemorative 1993 presidential inaugural license plates. The plates can be displayed until March.

## WINDOWS WEIRDNESS

**By Jeff McGreary**

Microsoft's Word for Windows Version 2.0 contains an undocumented feature that shows the triumph of "good" (Microsoft) over "evil" (WordPerfect). Follow these steps:

1. Make sure the paragraph marks are toggled on. If they are not, use the "Tools" menu to open the "Options" dialog box. Set the paragraph marks on and click "OK."

2. Use the "Tools" menu to open the "Macro" dialog box. Enter the name "Spiff" in the edit box and click the "Edit" button.

3. Delete everything in the document editing window except the middle paragraph marker.

4. From the "File" menu select "Close." Save the changes.

5. Using the "Help" menu, open the "About" dialog box.

6. Click on the Word for Windows icon and watch as the icon crushes the green WordPerfect monster. Following the monster's defeat, you'll be treated to a fireworks display and the names of the Word 2.0 development team.

Find any interesting, undocumented features in your applications? If so, please contact Lory Ota or Jodie Haire at (800) 343-6474. If we use your ideas, we'll send you a gift.

## The Fifth Wave

"IT WAS BETWEEN THAT AND NEW CLASSROOM COMPUTERS."

## Inside Lines

### Another software spin-off

IBM is set to announce its much-rumored Unix database next month, according to industry analysts. DB2/X, as the Unix version might be called, is said to have mainframe DB2-level power and security [CW, Nov. 9]. Being alpha-tested at selected RS/6000 sites, it is reportedly a cousin to the just-announced DB2/2, a 32-bit OS/2 database that understands DB2-style commands and file structures (see story page 12). No plans are in the works to create and unbundle a DB2-like database for the AS/400 line, which, like early iterations of OS/2, uses a database built into the operating system.

### That empty feeling

Word has been getting around that Microsoft's Windows NT software isn't all it's been cracked up to be [CW, Jan. 25]. According to a source at Bankers Trust, a big Windows shop, the bank recently completed testing NT, and the reaction was lukewarm. Now, the bank is testing a beta-test version of IBM's OS/2 2.1 operating system, which the source said is more feature-rich than NT. Bankers Trust is reportedly pleased with the ability to run its Windows applications in a native mode under OS/2 2.1.

### Rose-colored glasses?

Although Microsoft has yet to deliver DOS 6.0, independent software developers who have been briefed by Microsoft report that DOS 7.0 will have some preemptive multitasking capabilities under Windows 4.0. The development effort, scheduled for 1994, was designed to improve Windows' ability to function in a client/server environment.

### Getting tight

DEC and Microsoft are expected to further solidify their relationship later this month by announcing a version of Microsoft's Software Developers Kit for NT on Alpha AXP and platforms on which to run the kit. While DEC has demonstrated only a desktop version of its Alpha PC for NT, which is likely to ship with a 150-MHz chip as early as this month, the company has also tested NT on its higher end platforms and is expected to announce them as well, sources said. Announcements of DEC products targeting the commercial Unix market will occur next month at Uniforum, the sources added.

### No thanks

Vice President Albert Gore won't assume the role of communications czar, as many had expected and hoped, his chief of staff, Roy Neel, said last week. At a conference hosted by the Center for Strategic and International Studies in Washington, Neel said Gore will act in the "traditional role of adviser to the president" and will seek to make existing organizations work better rather than establishing new ones, as some techno-lobbyists have urged.

### Tech-savvy aide

President Clinton has asked campaign worker Jonathan Gill, a software developer from Medford, Mass., to stay on as his E-mail czar. Gill will be the director of electronic publishing and public-access E-mail at the White House, working with media affairs director Jeff Eller [CW, Jan. 18].

*Looks like Lotus' Notes is getting enough critical mass together to form a global user group. Daniele & O'Keefe Associates, Inc., a management consulting firm in Sudbury, Mass., has been hired to put the infrastructure for the organization in place. Kevin Brown at Corporate Software in Canton, Mass., is serving as acting president until a formal election of officers is held. Brown, who said he does not intend to run for president of the national organization, currently heads the Boston Notes User Group. The new group expects to be called Worldwide Association of Lotus Notes Users and Technologists (WALNUT). Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try* Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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*Tim Treneff, VAX Systems Manager, Kaiser Aluminum & Chemical Corporation, Rod, Bar & Wire Division*

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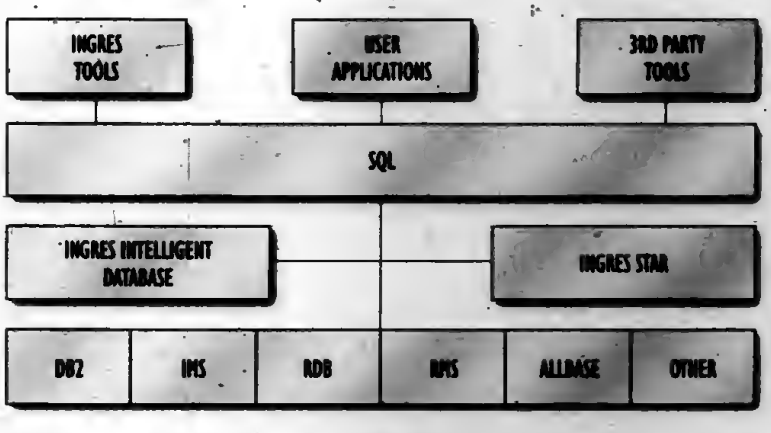


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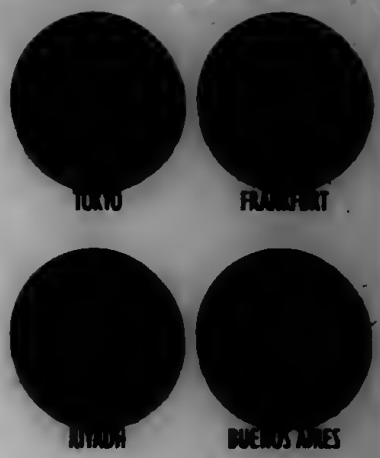


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